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ABSTRACT

This research project examined characteristics of nontraditional or midcareer teacher education programs that offered a fast track to certification, served students entering teaching from another career/occupation, and were based in a university or cooperatively managed by industry and education. The report begins with a description of the alternative certification movement, an analysis of the dissatisfaction with the preparation of teachers, the evolving definition of alternative certification, and variations and consensus points in alternative route programs. The second section describes five projects visited: the California Mathematics and Science Teacher Corps Project of California State University; the Mid-Career Math and Science Teacher Preparation Program of Mills College (California); George Washington University's Crystal City Secondary Teacher Education Program in Arlington, Virginia; Project Promise of Colorado State University; and Engineers Into Education of Digital Equipment Corporation. The report reveals that the number of individuals in nontraditional university-based programs is small, that the isolation of teaching professionals from their business/industry counterparts remains unchanged regardless of the alternative movement, and that there is much less concern about brining the worlds of practitioner and teacher together. Appendixes contain a copy of the survey form and a classification system of alternative routes to teacher certification. (Contains 21 references.) (JDD)

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ED 381 487

SUSTAINING THE SUPPLY OF MATH AND SCIENCE TEACHERS: ASSESSING THE LONG-TERM EFFECTS OF NONTRADITIONAL AND MID-CAREER TEACHER PREPARATION PROGRAMS

A report to the National Science Foundation

Meredith Ludwig and Laura Stapleton, the American Association of State Colleges and Universities

Burton Goodrich, Merrimack Education Center

January 10, 1995

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Meredith Ludwig
Laura Stapleton
Burton Goodrich
January 10, 1995

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Introduction

Research on the preparation, teaching practice, and characteristics of second-career teachers, is uncommon and has not enjoyed wide dissemination. There has been substantial development and evaluation of new preparation practice among those educators engaged in training nontraditional populations for second careers as teachers, and there is much that can be shared. For this grant project, the Office of Association Research of the American Association of State Colleges and Universities (AASCU) and the Digital Equipment Corporation recognized the need for information on the characteristics of viable programs and the impact of these programs on the teaching profession (particularly the supply and demand of mathematics and science teachers) and conducted a qualitative study of a small group of university and industry-based programs typical of the larger population of programs.

Over the past ten years, there has been increasing interest among mid-career professionals across the United States in entering into the teaching profession. Some of this interest has been generated through industry slowdown and downsizing. Other interest has been stimulated by countless reports about innovative efforts to restructure the United States educational system. National campaigns to attract new populations to teaching were launched in the late 1980s with mixed results. States sought to augment their teaching cadres by changing, simplifying, or providing alternative routes to the teaching credential. The target populations were as varied as the programs developed, including military officers, retired aerospace engineers, computer scientists, and business men and women. Some professionals who were volunteering or serving supportive roles in schools had reached a point in their lives when continuation of study was possible. Other mid-career professionals had decided to enter teaching and related education fields because of a strong personal mission to teach which remained unfulfilled in their previous occupations.

Responding to this interest, a small number of the university-based programs which emerged during this period of time specifically addressed second-career teacher preparation of mid-career professionals. These programs were developed with a recognition of a new necessity, as potential teachers "with degrees and experience in other fields must have specific training for teaching, but traditional forms and sequences of teacher preparation are not always appropriate or readily available," (National Education Association 1990). In addition, a small number of industries have worked with the education community to orient interested employees toward teaching or help them enroll in teacher training programs.

These programs are similar in that they prepare nontraditional students for teaching, but vary in their method of instructional delivery and in their curriculum. It is important to note that the nontraditional teacher preparation programs developed by colleges and universities may be as rigorous in their expectations and standards as traditional undergraduate and graduate programs, and in fact may look just like traditional programs. There is some confusion in the nation and in education itself about what to call these programs due to their academic goals and their status in relationship to the teacher education unit. Linda Darling-Hammond, noted researcher of teacher education and author of an important reference on alternative certification, describes nontraditional recruitment programs as "designed to provide potential teachers from nontraditional pools with the coursework and other requirements for full certification.... The programs do not require changes in state policies regarding teacher training or licensure" (Darling-Hammond, Hudson and Kirby 1989, vii). The National Education Association echoes this description as they explain that "nontraditional routes to licensure are distinguished from traditional routes only in the target audience, the training

certification programs which, while detailed and descriptive in their requirements, essentially serve the purpose of filling teacher slots in schools with individuals before they have completed a full teacher preparation program.

This report is structured as follows. In the first section, we will address the research goals of the project, the research method used, the alternative certification movement and the dissatisfaction with the preparation of teachers, the evolving definition of alternative certification, variations on university-based programs, and consensus points about the key issues and questions of concern to alternative route programs. In the second section, we will describe the five projects we visited. Among the data gathered from each site visit are the responses from program participants to an AASCU survey. These responses are integrated into each case description under the section entitled "The Participants", and are compared across the programs in the final section of the report. This last section compares the programs on a number of important characteristics and provides concluding thoughts and recommendations.

SECTION I

THE EMERGENCE OF NONTRADITIONAL AND MID-CAREER PROGRAMS

Research Goals of the Project

This research project was undertaken with the expectation that its findings would compliment those already published and shed some light on the relationships between organizations participating in nontraditional or mid-career programs. Our initial research questions related to the public policy issues about the status of the teaching profession and the interest in improving mathematics and science teaching by infusing the teaching of these subjects with the knowledge of professional scientists and mathematicians. We hoped to study any effects of nontraditional or mid-career programs on the attitudes toward the teaching and the math and science professions, the organizations bringing teaching and mid-career professionals together, or the regulatory and professional bodies which set the policies and processes essential to becoming a teacher. As we visited the case study sites, we realized our discoveries had a lot more to do with the programs themselves and their fit within the tradition of teacher education. Therefore, our discussion, conclusions, and recommendations are much broader than these three original research questions. The following five questions are the research issues this report ultimately addresses:

- Is this the way to change the supply/demand quotient?
- Why establish and support alternative certification programs?
- How do alternative programs contribute to the teaching profession?
- How do alternative programs contribute to our understanding of career choice and career relationships?
- What remains to be discovered and researched?

In the public policy arena of the 1980's, the interpretation of a program's value became confused with the name given to it. This, we propose, was due largely to the political context in which the idea of alternative routes was conceived. For this grant project, we were purposefully looking for programs which prepared prospective teachers and were based in a university or cooperatively managed by industry and education. These programs could call themselves alternative routes, nontraditional, or mid-career. The basis for the search was not the title, however, but rather the understanding that: the programs were academic in nature, they were fast-track programs to certification, and they served nontraditional students who were entering teaching from another career or occupation.

While the more detailed conclusions are arrayed at the end of the last chapter, we can say here that, in general, our findings are discouraging in terms of the relationships we were exploring. The interest in teaching as a profession among nontraditional populations of adults appears quite high, but this is due mostly to the high profile, independent recruiting activities of Recruiting New Teachers and Teach for America, as well as externally funded projects in which universities recruit talented individuals into the profession. In actuality, however, the overall number of individuals in nontraditional university-based programs is small. The isolation of teaching professionals from their counterparts in business and industry remains primarily unchanged regardless of the alternative or mid-career movement. The policy makers and their organizations are concentrating on improving the traditional route with standards-based reform, certification reform, and accreditation reform. These focuses will not eliminate the development of new nontraditional programs or arrest the current ones. However, attention is being paid to the knowledge, skills, and performance of each

prospective teacher, regardless of the delivery system from which he or she emerges. There is much less concern about bringing the worlds of practitioner and teacher closer together by mixing or exchanging these individuals.

Research Method

After receiving notification of the acceptance of the grant, we actively searched out potential case study sites. We sent out a notice in AASCU's newsletter, "MEMO: To the President," asking for interested programs to contact us, and we contacted officials at the United States Department of Education responsible for the Mid-Career Teacher Training Grant Program. We also contacted individual schools of education that we thought may have a mid-career math and science teacher preparation program. Finding industry involvement in the education of mid-career professionals offered more of a challenge. Most contacts were made through word-of-mouth.

The final study plan included site visits of four teacher education programs and a transition into teaching program offered by the Digital Equipment Corporation. The teacher education programs chosen for site visits were located at two public and two private institutions. Three of the programs involved a one-year, full-time commitment at the institution, and the other program was an evening, part-time program with no set time limits.

Each of the case study site visits lasted approximately three days and included class observation, student teacher observation, and interviews with faculty, administrators, students, and alumni. We also have had numerous conversations with additional teacher education program administrators and other interested parties about the programs and about teacher education for mid-career professionals in general.

Listed below are the five sites visited, the name of the program, and the names of the researchers who conducted the case studies:

<u>California State University, Dominguez Hills</u>
California Mathematics and Science Teacher Corps Project
Carson, California
Laura Stapleton, AASCU
Burton Goodrich, Digital Equipment Corporation, now of the Merrimack Education Center

<u>Mills College</u>
Mid-Career Math and Science Teacher Preparation Program
Oakland, California
Laura Stapleton, AASCU
Burton Goodrich, the Merrimack Education Center

<u>The George Washington University</u>
Crystal City Secondary Teacher Education Program
Arlington, Virginia
Meredith Ludwig, AASCU
Laura Stapleton, AASCU

<u>Colorado State University</u>

Project Promise
Fort Collins, Colorado
Meredith Ludwig, AASCU

Digital Equipment Corporation
Engineers Into Education (EEP)
Chelmsford, Massachusetts
Meredith Ludwig, AASCU
Laura Stapleton, AASCU
Burton Goodrich, the Merrimack Education Center

A description of each of the education programs follows in the next section. Included in each description are information from the programs' literature and observations made during campus visits (including interviews). We have organized the characteristics of each of the programs into the following subheadings:

- Setting
- Program Objectives
- Beginnings
- Program Curriculum
- Selection
- The Participants
- Faculty
- Program Costs
- Lessons Learned
- Update

The case studies were done, for the most part, in the fall of 1991 and spring of 1992. The following section describes the programs at that time. Where great changes have been made between that time and summer 1994, we have included an "Update" as appropriate.

We also have included results from a survey we conducted of 372 students and graduates of the teacher education programs and 200 Digital Equipment Corporation employees who went through the "Engineers Into Education" program. This survey, conducted in 1992, contained various items about making the switch into teaching including: the demographics of the respondent; why they chose to enter the teaching profession; what aspects of their teacher education program were weak or strong; their opinions of public schools and teaching; and the preparation for and level of comfort with certain aspects of teaching. A copy of the survey is located in Appendix A.

The Alternative Certification Movement and Dissatisfaction with the Preparation of Teachers

This NSF research project was conceived at a time when the supply and demand issues in four education and training systems in this country seemed to be aligned. The military services were preparing for a downsizing by early retirement of experienced and well-educated active duty members. The public education system was experiencing teacher shortages in specific disciplines, such as math and science. Businesses also were engaging in dramatic and short-term displacement

of middle managers, and higher education was seeking to recruit students interested in preparing to be teachers. Two of the three forces (a potentially rich supply and the identification of demand) which drove the development of the alternative recruitment certification movement in the mid-1980s were thus in place.

A third force, a lack of consensus about the purpose of education and the preparation of teachers, served as the proverbial last straw to propel a movement of alternative recruitment and certification of new teachers. Politicians, educators, and communities voiced dissatisfaction with the quality of teaching in public schools, the underrepresentation of minorities in the profession, and the lack of preparedness of schools for impending shortages in some discipline and special needs areas. Inadequate professional curriculum, a perceived intransigence in schools of education, and an inconsistent system of certification were blamed for these deficiencies. To complicate these matters, there was an ambivalence expressed, on the one hand, by providing loopholes for entering the practice of teaching, and on the other, by exercising influence on teacher education programs via specifying admissions requirements, limiting education credits and increasing liberal arts requirements, extending observation and field experience requirements, and requiring competency testing.

Some educators and politicians were calling for the elimination of schools of education. Others offered the idea that the creation of alternative certification routes could be an administrative answer to deal with shortages in schools which were due both to specific discipline supply problems and school desirability issues. (The condition of schools in some areas was thought to be so depressed, that it was difficult to attract teachers who were prepared to teach there. Instead, teachers would seek posts in suburbs of major cities, where the conditions for teaching and learning were thought to be more safe, and student and parent interest in education high.) But even within this latter group, there was disagreement about the way to address the situation. Emergency certificates, which were temporary and allowed teaching candidates to waive traditional requirements, were already a route to teaching permitted in most states. The number of teachers teaching out of field and on emergency certificates was well-documented by teacher education organizations such as the National Association of State Directors of Teacher Education and Certification (NASDTEC), the National Education Association (NEA), the American Association of Colleges for Teacher Education (AACTE), and the National Center for Education Statistics (NCES). According to a 1985 Department of Education report, 3.4 percent of all teachers did not have credentials appropriate to their fields of assignment, and 12.4 percent of all newly hired teachers were not fully certified in their assigned fields (National Center for Education Statistics, 1985).

In response to concerns about the quality of individuals entering the profession through emergency routes and the number of teachers who were teaching out of field, improved alternative certification processes were established within states. This involved some kind of mentorship, education, or a combination of these experiences for individuals with baccalaureate degrees. In some states the requirements were quite elaborate. The development and changes in this area of certification were chronicled by: Linda Darling-Hammond, Lisa Hudson, and Sheila Nataraj Kirby (1989), the U.S. Department of Education, Office of Educational Research and Improvement (OERI) which funded 20 Mid-Career Teacher Training Projects between 1990 and 1992; the Education Commission of the States (ECS), which produced a directory and summary of programs in 1990; Adrian Baird of the U.S. Department of Education, who produced directories of alternative routes to certification by state in 1991 and in 1992; and Emily Feistritzer and David Chester of the National Center for Education Information (NCEI) who conducted two state-by-state analyses in 1992 and

in 1993. AACTE published a directory of postbaccalaureate programs considered alternative paths to teaching in December 1993. Recruiting New Teachers, Inc. is currently planning a directory, as well. Each of these efforts began with slightly different definitions and thus encompassed a slightly different population of programs.

According to Darling-Hammond, Arthur Wise, a former Rand Corporation researcher and currently head of the National Council for the Accreditation of Teacher Education (NCATE), and other researchers, the emergence of alternative routes to teacher certification has been one reform effort at the center of which is the timeless question of the professionalization of teaching. Such a tension between the academic side and the professional side of teacher preparation has existed since the first preparation schools for teachers were established in 1839 (Clifford and Guthrie, 1988).

The career of teaching began as a temporary position, first for males who were university-educated and destined for leadership positions in the church, community and universities, and then for females, for whom it was seen as an appropriate transition to marriage and motherhood. The spread of the common school movement in the United States in the 1800s however, raised the demand for teachers and therefore, normal schools were established by states and regions to be professional training centers. One to two years in length, the emphasis of these centers was on training and practice. Male administrators of normal schools were graduates of the universities who did not recognize teaching as a discipline. At first, they succeeded in preventing the normal schools from developing into academic institutions, instead concentrating on the elements of practice that would ensure all teachers would be able to teach reading, writing, and arithmetic. The hiring process of teachers, controlled by the communities with common schools, reinforced this training experience and the hierarchy of control.

This view of teacher education as vocational training changed when the universities decided to take control of the preparation of the field. Clifford and Guthrie (1988) point to the years between 1900 and 1940 as the key formative years of the schools of education in this country. At that time, universities which decided to take the training of teachers as their responsibility were occupied also with building the character of graduate education based on the research university model from the great university learning centers of Europe. In the 1890s, some normal schools changed from being one to two year schools to becoming degree-granting institutions known as teacher colleges. Others were annexed by universities. Programs located in universities obtained prestige from requiring the prerequisite years of liberal arts studies and from the infusion of scientific research as the basis for the development of the knowledge base of teaching. There was an attempt to raise the entry-level degree to the first-professional level, as in other professions, such as law and medicine, with the same systems of review of programs and certification and licensure of professionals. While this did not occur (teaching is not a first professional degree), teaching professionals have become increasingly more educated over the past 30 years, reflecting the influence of universities and of teacher organizations seeking greater professionalization of the role. For example, while most new teachers still come directly from undergraduate programs, they eventually earn master's degrees. In 1991, 52.6 percent of current teachers held a master's degree or six-year diploma according to NEA data. As recently as the 1920s, teachers were first required to complete college credit courses and not simply pass validation exams to be certified. In 1961, 14.6 percent of teachers held less than a bachelor's degree; 61.9 percent a bachelor's as their highest degree and 23.1 percent a master's or six-year diploma (Haselkorn and Calkins 1993).

The Evolving Definition of Alternative Certification

In the most recent compilation of alternative teacher certification options, the NCEI reports that the interpretation of alternative certification, referring to the implementation of initiatives, has shifted from "earlier references to emergency certification to today's rather sophisticated and well-designed programs that address the professional preparation needs of the growing population of already degreed adults with considerable life experience who want to become teachers" (Feistritzer and Chester, 1993, 1).

The 1983 survey of state directors of teacher education by NCEI found that in 46 states, substandard, limited, or emergency certification was allowed. In addition, in 27 of these states, individuals without a bachelor's degree were teaching and holding these kinds of certificates. The growth in the number of alternative initiatives by the end of the 1980s and the tendency of states to use the term as an umbrella continued to confuse the issue. To eliminate this confusion, NCEI survey analysts have provided a classification of routes by purpose and requirements to help individuals select the route they want. This classification also helps researchers and policy makers follow changes in the field (Feistritzer and Chester 1993, 25, Table 1). A copy of this table is provided in Appendix B.

According to NCEI, there has been an increase in the number of states which use the alternative certification term to refer to new programs meeting admissions and completions requirements and designed to bring adults with a bachelor's degree into teaching as new professionals. NCEI findings for the past two years illustrate the evolving understanding and use of alternative certification programs. While eight states reported implementing alternatives to an approved college teacher education program in 1983, the NCEI found that by 1992, 40 states reported such implementation activity. The NCEI also makes a distinction between alternatives to traditional teacher education programs and "true" alternative teacher certification programs. "True" programs, the NCEI claims, include formal instruction and mentoring while teaching, and are not driven by discipline shortages nor are they targeted to specific grade levels. The NCEI reports that in 1992, 11 states had designed "true" alternative teacher certification programs and by the next year, an additional three states had implemented such programs (Fesitritzer and Chester 1992, 1993).

While the interpretation of alternative may indeed be evolving, it is important to note that the number of "true" programs is one small part of the total number of programs reported by state respondents to NCEI in 1992. In 1992, 77 programs submitted by the states as alternative routes were emergency certificates, waivers, and other types of programs requiring no formal preparation for teaching before permitting an individual to practice in the classroom.

By 1993, states were reporting that the greatest activity in the area of alternative routes had occurred in institutions of higher education with teacher preparation programs. In 29 states, institutions of higher education have developed alternative programs leading to a teaching license (Feistritzer and Chester, 1993).

The programs chosen for study in this NSF research effort are closer to Class E programs (postbaccalaureate programs based at institutions of higher education), as defined by NCEI in its report. However, to emphasize the possible confusion that exists, they have elements of some of the other classes. For example, they may be targeted toward a specific shortage or they may be targeted toward a group of talented individuals who are outside of the teaching profession. Also, while some are cohort-based and located fully at a university, others are individually developed with the assistance of the university and the school system.

In the 1980s, two organizations, one representing teachers, the NEA and the other representing teacher education faculty, the Association of Teacher Educators (ATE), produced policy statements to guide their members in the development or evaluation of alternative route programs, or the participation in programs emerging in their states. We can use these two organizations to illustrate the controversy over the definitions and the variety of state policies regarding alternative routes.

In May 1989, the NEA Board of Directors authorized a study of the issue of nontraditional routes to state licensure. The statement made it clear that the Association's "overriding objective" should not be breached by any policy on alternative routes; that is, that "every professional position in schools should be filled by a fully qualified and licensed educator" (National Education Association 1990, 2). In language careful to place alternative routes within the tradition of teacher preparation rather than outside it, NEA refers to these approaches as additional opportunities to meet this objective of professionalism. In addition, NEA policy recommended that there be a link between alternative routes and restructuring of teacher education programs, schools, and restructured relationships between higher education and prekindergarten-12 faculty. Enriching the pool of teachers with hard-to-recruit groups such as currently-serving educational support personnel, minorities, and mid-career professionals with degrees in specific fields, is the principal reason for supporting such a program, according to the NEA. The policy and recommendations offer the hopeful view that the existence of nontraditional routes will reduce the historical tendency to lower admission standards for programs in order to meet recruiting needs (National Education Association 1990). In fact, a trend reversing this tendency has been developing since the mid-1980s, and the typical education preparation program now identifies not only a minimum grade point average for general education courses, but also an expected level of achievement on tests, and even specific school observation requirements prior to admission.

ATE took a slightly different tack and focused on the reality of alternative teacher certification routes. The authors of this piece examined the implications of the growing number and diversity of this group and determined that very specific recommendations and guidelines were needed to safeguard the quality of the preparation experience. Although it condemned the use of emergency-certified and out-of-license college graduates functioning as teachers, the ATE accepted the existence of alternative certification processes described as:

- State passed legislation or state education agency established policies and procedures for licensing teachers with no prior professional training;
- School districts empowered to hire alternative candidates;
- Alternative programs developed to recruit from among special groups of individuals with college degrees;
- Hands-on or on-the-job required professional training with some supporting workshops;
- School-based programs with or without the cooperation from universities;
- individual faculty from universities may be contributing their services (Association of Teacher Educators 1990).

ATE developed 23 specific recommendations addressing the background studies required of all alternative teacher certification program candidates, the measures of screening, the nature and individuals involved in the screening interview, conditions of prior supervisory experience, status

of teacher candidates working in schools regarding pay and professional status, location and relationship of teacher candidates and mentors, and the number of courses they should take while teaching. Finally, commenting that alternative programs are more costly than traditional programs, the organization's document suggests that program evaluations, comparisons of the effects of teachers trained in different programs on student learning, public disclosure, and involvement of teachers in decisions about certification of these candidates were important and had not been thoroughly addressed in other writings and recommendations (Association of Teacher Educators 1989).

As the standards' based reform movement continues to gather strength, the performance of teachers, new and veteran, is the focus. New non-governmental organizations, such as the National Board for Professional Teaching Standards, are developing processes for certification of the qualifications of experienced teachers. Nevertheless, states remain in control of the certification and licensure process. Alternative routes will remain for those who wish to work through the detailed processes, but these may be declining in number as the concern over what teachers should know and be able to do leads to strengthened teacher preparation programs and alternative assessments of new and veteran teachers.

One sign of this change is the new attention being given to university-based training and the relationships between training programs and state leadership in education reform by the two highly publicized groups seeking to attract talented individuals into the teaching profession: the Recruiting New Teachers Campaign (RNT) and Teach for America. RNT began as a public advertising campaign to raise the awareness of the public about the job of teaching and to raise the status of the job in the public's eyes. It then turned to providing comprehensive information resources to individuals and undertook a survey program to document alternative preparation routes for para-educators and for precollegiate students interested in the profession. It has sponsored a national conference to address state policy issues regarding teacher education and certification.

Teach for America began as a one-woman effort to attract teachers for urban classrooms. There has been some attempt to gain approval of this alternative approach from state certification and licensure authorities. In addition, support and cooperation from institutions of higher education has been sought. However, Teach for America has recently come under a great deal of criticism from participants, from its own staff, and from educational researchers concerning its on-the-job training style. The national program has reviewed and revised its preparation program to include some academic components to make it more responsive to some of these concerns. However, the long-term viability of this route is not guaranteed by any means.

Again, these shifts do not indicate the end of the alternative route movement, but rather the redirection of public policy toward the qualifications and performance of teachers as the outcome of their preparation. This redirection is being complimented by collaborative meetings and statements from organizations addressing teacher preparation and individuals in policy making positions, as they work towards a set of common goals to revamp the certification and licensure process.

Variations on University-Based Programs

In the beginning of the section on the alternative preparation movement, we referred to the downsizing of the military as an impetus to program development. The Department of Defense became an important partner in the nontraditional route movement by sponsoring a number of efforts which help service members focus on teaching careers and pursue them, even while on active duty.

Teaching as a New Career helps veterans make a transition to civilian life and obtain the education needed to become teachers or school administrators. Eligible personnel are those on active duty within four years of retirement, reservists, retirees of less than five years, as well as spouses of military personnel and federal employees.

Troops to Teachers provides federal assistance to encourage servicemembers to pursue a teaching career. This is accomplished by providing stipends to those who have entered a teacher preparation program and agree to teach for two years in a school system meeting federal criteria regarding the income level of its students' parents. The grants are awarded through the collaboration of an institution of higher education and a local education agency.

Servicemembers Opportunity Colleges Education (SOCED) is a teacher preparation facilitation effort that is one component of the Servicemembers Opportunity Colleges (SOC). Sponsored by the Department of Defense, SOCED, like other information and articulation efforts offered through the 1,000 higher education institutions belonging to SOC, relies on agreements as to the transferability and acceptability of a set of courses. In this case, a set of courses has been identified by the participating institutions in SOCED who have agreed to accept the set as the professional core for teacher preparation. Servicemembers enroll in and receive credit for these courses, whether they are offered at a college or university campus or an education satellite office on or near military installations (including those overseas). SOCED does not guarantee a teaching position and does not certify participants who earn credit in these course areas. It provides information about higher education institutions and the landscape of teacher preparation and certification to servicemembers who are interested in working their way toward certification. The core set of courses are: Educational Psychology, Foundations of Education, Introduction to Education, Human Growth and Development, Strategies of Teaching, Learning Theories, Classroom Management Techniques, and Computers in Education.

Another set of externally funded alternative route programs located at universities and colleges was sponsored in the years from 1990 to 1993 by OERI. Although the funding for the grants has ended, in some cases the program efforts have expanded or evolved in new directions. The projects, which are representative of the diversity to be found as to goal, size, and outcome, share concerns about the participants, the internal strains created by the location of the program in the school of education, and problems regarding recruitment, assessment, placement, curriculum delivery, administration and integration. In March 1992, the OERI sponsoring office held a project directors meeting in Washington, D.C. which we attended. Following are brief descriptions of some of the programs represented as they were detailed at that meeting:

DePaul University, Urban Teacher Corps Program: Interns worked full-time during the week at a school and then participated in Saturday courses at the university. The OERI grant helped with a 40 percent reduction in tuition. Mentorship coordinators were at each school. Parents and community members were involved as part of the philosophy of the program, so interns in the schools would have the experience of working with all groups.

Old Dominion University, Military Into Teaching Career Transition Program: The Virginia Beach area had a high concentration of military servicemembers who were approaching retirement and were interested in education as a career, thus the supply was adequate to support the program. Briefings held at military bases provided information about teaching as a second career and the university supported the project at a level of half of the operations' budget. Courses were taught on the bases, then followed by six weeks of student teaching. Standard studies composed the program but requirements, including length of student teaching, were adjusted based on the experiences of the former military members.

Saint Martin's College in Lacey, Washington: College administrators reviewed alternative programs throughout the country and established the only one in the state. Lacey is located in a remote area with few employment opportunities, limiting students to part-time jobs to support themselves while in the training program. Cooperation from state and local officials resulted in funding assistance so students could remain in the program and complete all internships and field experiences, even though the institution could not find paid internships for them. Beginning courses were offered at night at community colleges. Two aspects of the program require a unique cooperation with the state of Washington and other higher education institutions: paying mentors to work with new teachers in order to provide student teacher supervision in remote or inner city areas and obtaining approval for awarding credit for experience.

George Washington, University Crystal City Secondary Certification Program: The grant helped support the administration of the program and provide tuition scholarships to a number of students. Issues raised by the project coordinator were the need for: (1) closer collaboration with school districts to allow students to student-teach nearer their homes and where they would hope to be employed after the program is completed; (2) recognition of the need for a supportive policy of paid leave for military personnel while student teaching; and (3) development of a strategy to update the content knowledge without losing adult students who did not wish to be in schools for the requisite length of time or had no way to support additional course-taking expenses.

The City College, Mid-Career Mathematics Teacher Training Program: Attrition of math teachers and an overall shortage of certified mathematics teachers in the city schools led the program to seek an award to implement a nontraditional plan to increase the number of qualified teachers. Selecting 29 participants from business and industry, the institution engaged them in a two-year graduate degree program. The program coordinator acknowledged needs for a comprehensive assessment and tutoring program to remedy academic weaknesses. For example, some students had a financial background rather than one of applied mathematics. The project personnel also discovered that collaboration with school systems should include a component of placement services for graduates of the program.

University of Pittsburgh, Master's in the Art of Teaching: The program's goal was to attract mid-career changers who are African-American to a Master's in the Art of Teaching (MAT) program. At the time of the Project Directors meeting, the coordinators were trying different strategies to meet these problems, such as: (1) assessing an individual's circumstances that enable a candidate to return to school full-time; (2) identifying indicators of success in the program and in the school setting; (3) identifying sources of funding to sustain enrollment; (4) evaluating and validating life experiences; and (5) being aware of policies and guidelines within school districts and at state and building levels.

University of North Carolina at Chapel Hill: This project used its advisory committee (including representatives from the military, industry, public schools, and the university) to develop the curriculum which was then piloted with career master teachers' assistance. This curriculum

consisted of four courses followed by a student teaching internship. Recognizing that a $1,000 stipend was not enough to facilitate recruitment, fundraising from other sources was sought and achieved. The program was expected to train 15 teachers in each of its two years of operation. The UNC program looked for candidates who had at least five years of full-time professional work in a field directly related to the subject taught and a strong academic and professional record, including proficiency in the subject area. Therefore, the course requirements consisted of foundations, principles, and methods of teaching only. A competency-based approach to determine fulfillment of the subject area requirements was being applied.

SUNY College at Buffalo, Minority Teachers for Special Education Mid-Career Program: Based on an identified shortage of minority teachers in the Buffalo public schools, the program coordinators developed a process to select and support the education of more minority teacher candidates. They selected four candidates at a time and used the grant to pay their tuition. In addition, these students received a supplies allowance. The program was successful in developing enough interest such that a waiting list of candidates had to be developed. The most critical question identified through the project efforts was what are the factors which support the success of minority students in a university? This program was located in a predominantly white institution and to address this critical question, the grant provided support of two faculty: one to provide academic counseling and support services and the other to monitor students consistently to resolve nonacademic problems.

San Francisco State University, ENCORE/Military Program: This program was a collaboration with the U.S. Army, San Francisco Unified School District, California Department of Education, the U.S. Navy, and Chevron USA, Inc., and resulted in a preliminary teaching credential and a master's degree in education. To help military personnel make a successful transition, the program provided each candidate with direct personal support, assured a close relationship among professionals from the different cooperating partners and provided weekly opportunities to discuss concerns with a resource team.

Consensus Points between the Programs

What was most beneficial to us was the work done at this OERI meeting on the common concerns of the programs and their nontraditional and mid-career student participants. We came away from the meeting with a better sense of common challenges of the nontraditional programs and found these helpful in formulating our interview questions. These concerns and some of the recommendations of these education programs are supported in the research reviewed for this grant report and in the findings of our own case studies.

One of the most poignant issues raised by the program coordinators and directors at these alternative route sites was the recognition that an inherent difference of perspectives will always exist between the mid-career student and that of the teacher educator (even those who are proponents of the alternative route). The student wants the program to be individualized and quick. The educator is not convinced that these students need different content than the traditional students and is reluctant to eliminate the important (and time-consuming) components: in-school experience, the development of an understanding of community, reform perspectives and questioning skills, and exposure to and comfort with educational vernacular.

While the programs may be different as to attendance patterns, delivery mechanisms, time frames, as well as age and background of students, the directors, coordinators, faculty, and

cooperating partners agree that the goals of the in-school portion should be the same: to improve instruction, prevent attrition, develop school culture knowledge, and develop an understanding of the needs of the students. The adult students in these alternative route programs have strong voices. They recognize inconsistencies and they have strong beliefs about learning. They know how to work within the system and they are motivated to reach their goal. Finally, even though their experience and maturity would lead one to think otherwise, they are more fragile than the students in a traditional undergraduate program in terms of their views of themselves as teachers and their anticipation of the work setting.

University support must be earned by documenting successes and demonstrating that the program is not taking away from, but adding to the status of the larger school or division. Knowing where support is to be found and seeking the involvement of those administrators is a good way to start. One then must convince faculty that the program is consistent with the mission of the institution, will not detract from the quality or reputation gained by the institution from its other graduates, and that the program can be self-sufficient and link with other resources, such as other higher education institutions, and thus will not increase their teaching burden.

Assessment of students in alternative programs is critical at three points in their experience: admittance, continuation, and completion. It is important to remember that the program is preparing an apprentice teacher, not a finished one. Some assessment techniques used by the programs which can then be models for the teacher candidates in their own practice include journals, portfolio development starting with the screening process, interviews by groups, on-site writing samples, Outward Bound experiences to build trust and bond the group with the education faculty and cooperating teachers, and first-year follow-up advising to the extent possible.

The project coordinators and attending faculty at the OERI Project Directors meeting raised questions for which, they agreed, there were no easy answers:

- What proportion of a nontraditional program should deal with career transition issues?
- How do you begin the nontraditional student experience (volunteering or tutoring)?
- What do you give cooperating partners in schools as incentives or rewards?
- How can we sustain teaching models as teacher educators in these programs?
- What cooperating agents are needed for recruitment?
- What happens when there are many sites cooperating and individuals in one or more of them wish to control the ideas and development of the program at their own location?
- How do mid-career students mix with other students in the education school or department?
- How can the profession ensure the quality across internship experiences when they vary so much by length and intensity?
- Should we be training these nontraditional candidates to be change agents because of their orientation and experience, compared with traditional program students?

The five programs we visited experienced many of these challenges and chose to concentrate on one or more of the challenges as they built an educational process to support the transfer of an individual from one career to a second one of teaching. In the case studies which follow, we address

them when they appear as distinctive goals or features of the program setting, curriculum, assessment, or lessons learned.

SECTION II

CASE STUDY DESCRIPTIONS

California Mathematics and Science Teacher Corps Project
California State University, Dominguez Hills

Setting

Like many campuses in the California State University System, CSU, Dominguez Hills has experienced dramatic enrollment growth over the last decade. Its headcount enrollment figure has gained nearly 3,000 students in the last 15 years, marking an increase of over 40 percent. The campus facilities show this growth. Building construction is abundant around the relatively new campus and, in the style of a suburban campus, many of the buildings are one or two-level. All students commute to the campus.

CSU, Dominguez Hills is a regional comprehensive university located in the sprawling suburbs of Los Angeles. The campus enrolls over 10,000 students, half of whom attend on a part-time basis. Nearly two-thirds of the students are female, and the students represent an ethnically rich population: 40 percent are white, non-Hispanic students, another 30 percent are black, non-Hispanic, and 16 percent of the students are Hispanic. Additionally, ages of students range greatly, and the average age is reported to be in the early 30s. One-third of the enrolled students on campus attend as graduate students.

The institution grants about 900 baccalaureate degrees to students each year, with business being the most popular major (34 percent). Over 400 master degrees are conferred each year, most in the discipline of education (37 percent).

Program Objectives

The objective of the California Mathematics and Science Teacher Corps Project is to train retired engineers, supported financially by aerospace firms, to receive a California teaching credential. The program was designed to alleviate the problems of identifying personnel to teach in the fields of science and mathematics, and to improve the quality of science and mathematics education in secondary schools. Specific objectives of the program, as noted in program handbooks, are to:

- Recruit, select, educate, credential, and place individuals from the aerospace, the military, and related industries as teachers of mathematics and science in secondary schools;
- Create new career opportunities in science and mathematics teaching for personnel from the military and aerospace industries that build upon their unique backgrounds in mathematics, science, and engineering; and
- Develop a model for the training of mid-career professionals that can be replicated in colleges and universities throughout the United States.

Beginnings

Frank Collea, director of the Office of Research and Sponsored Grants at the CSU System Office, was interested in piloting a teacher education program for aerospace engineers, modeled after other successful programs in the CSU system, such as the collaborations between San Diego State University and the military, and between San Francisco State University and Chevron (see Madfes 1991 and Dessel and Mehaffy 1989 for information on these programs). Dr. Collea presented his

idea in the summer of 1990 to the CSU Foundation Board, whose members included several key CEOs in the state of California. One member who was duly impressed, Sam Iacobellis, CEO of Rockwell International, agreed to initiate the program with the California State University System.

California State University, Dominguez Hills was selected to be the host institution for the one-year experimental program, now titled "The California Mathematics and Science Teacher Corps Project." The project was conceived for the initial year of operation as a consortium involving the Office of the Chancellor at California State University, the School of Education at CSU, Dominguez Hills, and Rockwell International. All three organizations contributed to the funding of the project. In August of 1990, recruitment presentations for retired engineers were held at Rockwell International and classes started that September with 11 participants. An additional five retirees joined the group after a recruitment seminar held in early October. All of the participants had retired within the previous 18 months.

The project was designed so that the academic course requirements were identical to the traditional fifth-year program at the university. Therefore, no time was devoted toward the development of a special curriculum.

After the first cohort finished the credentialling year, Sam Iacobellis approached his colleagues at other aerospace companies, including TRW, McDonnell-Douglas, and Hughes, to solicit their participation and was ultimately successful. The second cohort year started in January 1992 with the participant selection process completed the previous fall, involving all four aerospace firms.

Program Curriculum

The School of Education at California State University, Dominguez Hills reports a strong commitment to the following six specific goals:

- Evaluate, promote, and apply the latest research-based schooling practices;
- Exhibit skill in providing equal learning opportunities for all students;
- Develop curricula which tap higher order cognitive processes;
- Encourage collaboration/cooperation among learners;
- Exhibit cultural and linguistic sensitivity toward learners from diverse backgrounds; and
- Balance theory, research, and practice.

As noted above, CSU, Dominguez Hills already had a fifth-year teacher education program in place before the pilot program with aerospace engineers began. Many individuals entered into that program from other careers, attending either part-time or full-time. Therefore, with the course structure already in existence, no curriculum development was needed to accommodate these new students. However, an important and unique element of the program is the collegial support that exists between participants and is carried through the 32 credit hour program. This care and interest is achieved, in large part, through the efforts of the program director, Dr. Robert DeVries. All participants are expected to complete the following courses together, in sequence:

<u>Early January</u>

Observations--visit classrooms (1)

Classroom Management (2)

Spring

Methods/Secondary Reading (3)
Motivation and Learning (3)
Multicultural Perspectives (2)
Foundations in Education (1)
Introduction to Classroom Teaching (1)
NTE Preparation (3)

Summer

Individual preparation for the NTE
Take the NTE

Fall

Directed Teaching (12)
Secondary Math Methods (3)
Seminar in Teaching (1)

Over nine days in the first few weeks of January, the participants visit over 20 classrooms in three different socio-economic status areas of Los Angeles. These first days of the program are focused on submerging the participants into the school culture to get a sense of the cultural aspects of the schools. This period is also intended to be used as a self-selection tool--students may drop out of the program after experiencing the reality of today's schools. The 1992 cohort was the first to go through this classroom visiting process, and none of the participants subsequently dropped out (a fact which Dr. DeVries feels indicates the adequacy of the initial selection process). During these few weeks in January, new participants also attend seminars on classroom management. The faculty member who teaches this course, Dr. Mimi Warshaw, describes the course as emphasizing "positive classroom discipline"--looking at the environmental setting, including the room arrangement and classroom rules and procedures. She emphasizes being an effective instructor by stimulating self-discipline in each student. Because most teacher education students at CSU, Dominguez Hills enter the teaching force in "hard-to-staff" schools, Dr. Warshaw feels that the classroom management course is very important. "These students need to be prepared for the culture shock of inner city schools, especially the mid-careerers, because they are coming from a totally different environment." Dr. Warshaw had anticipated that the group would be shocked by what the kids were like. In fact, the 1992 cohort expected the worst and were pleasantly surprised by what they found. "Maybe Bob's [Dr. DeVries] orientation prepared them for that," said Dr. Warshaw. "If so, it should be done every year."

For the remainder of the Spring semester, the participants attend seminars on Tuesday and Thursday and observe and tutor in the schools for two periods on both Monday and Wednesday. We sat in on a session each of the Motivation and Learning seminar and the Methods seminar. Both included hands-on learning. The setting was a traditional classroom. The chairs were in rows, the instructor was standing at the front, and the blackboard was the focus of the room. However, these learners were anything but "traditional" students in the way they asked questions and challenged the instructor. Also, some students even volunteered that they didn't understand a certain topic. It was

apparent that these students trusted one another as they admitted their ignorance and looked toward their classmates for help.

The faculty for these classes did an excellent job of integrating classroom management techniques into the classroom without being condescending to the students. Because he had spoken out of turn too often, one student had his name written on the blackboard. After about half an hour of appropriate behavior, the professor allowed the student to erase his name from the board. The students laughed and talked about the classroom management technique (as they congratulated the student on his "good" behavior). Using classroom management techniques geared for teenagers could risk alienation of the adult students--but these faculty have mastered using the techniques and letting the adult students know that the discipline just used could be used in their future classroom as well.

We spoke with Ms. Ana Serrano, the instructor of the Multicultural Perspectives course, another seminar taught in the Spring. She was very interested in working with these engineers-come-teachers, and described them as an "exciting group." She explained that they were very eager to learn and that, for every assignment she would give, they would come back with "a world of information." This group, in fact, has made her even more aware of issues facing ethnic groups because they read a wide array of newspapers and brought in related articles on their own.

She also noted that the participants were very professional in all of the presentations they gave and they would pursue questions if they wanted to know more about something (a trait generally not found in her younger, less-experienced students). She also thinks that because these students attend full-time, they have more time to look into educational issues, and unearth questions of their own. She requires the students to learn how to *research* a specific ethnic group, instead of depending on broad generalizations about certain ethnic groups. Because the Los Angeles schools provide a great diversity of students, these future teachers will meet a wide range of students in their classes, and she expects and encourages them to find out more about these students on their own. She does tailor the course for the engineers, however. The students who make up her other classes, mostly teachers' aides or interns currently working in the schools, have experience in lesson planning, so her curriculum content for them deals less with methods and more with multicultural issues. However, because the engineers do not have that lesson planning experience, most assignments include a lesson plan component.

As a second field experience, participants in the California Mathematics and Science Teacher Corps Project attend two class periods in Los Angeles area middle and high schools to observe and tutor on both Tuesdays and Thursdays throughout the Spring semester. Participants were expected to begin by observing, but slowly work into tutoring, and end the term in the role of a teacher's aide. On a Tuesday, we attended classes with two participants at their chosen schools. Even though it was well into the term (early April), we did not find the participants acting as tutors--just passive observers. In fact, they appeared to have no interaction with the students. Perhaps because the participants were originally introduced as "observers" the students placed little value on the engineers' presence in the classroom. This experience may have been unusual, however, it raised the question of the significance of the background of prospective teachers to the students they observe and eventually teach.

We spoke with one participant about the process of selecting a class to observe. We were sitting in a seventh-grade general math class, taught by the track coach. This teacher lectured from his notes, without using visual stimuli. The room decorations consisted not of mathematical principles nor formulas, but photos of the track team. He spoke to the floor and although it was

obvious that students did not understand (as evidenced by the questions they asked of each other) the teacher did not attempt to clarify himself. The engineer whispered that he knew that this was not the way to teach and he chose to observe this teacher for that very reason--he wanted to learn by others' mistakes.

In addition to observing in the schools and attending seminars, the participants meet on Fridays with Dr. DeVries for one hour to discuss their experiences in the schools and any problems they might be having with the program. Dr. DeVries sees his role as an ombudsman. Because he has been hired by the university for the sole purpose of administering the program, and did not come from the faculty of the university, the participants see him more as "one of them". Dr. DeVries indicated that in his role as ombudsman he has been able to change many aspects of the program to be responsive to both participants and school personnel.

Over the summer, participants are expected to continue to prepare for and take the National Teachers' Examination (NTE). Because half of the engineers in the first cohort did not pass the math component of the NTE on their first try, program administrators have strengthened the NTE preparation component of the program. These retired engineers have not seen formal math equations in a testing situation in decades, and therefore need special preparation in order to become re-familiarized with the concepts.

During the fall semester, students must do two preparations of directed teaching, and take additional courses titled Secondary Math Methods and Seminar in Teaching (a discussion seminar for reflection on the student teaching experience).

Recruitment and Selection

When the program began in 1990, letters were sent to recent Rockwell International retirees informing them of the teacher education program and soliciting their application. There were no selection criteria in place at the time and this was cited as a problem by program administrators, noting that participants did not fully understand what they were undertaking, especially with regard to the physical demands of teaching. Several participants in the first year of the program withdrew or did not get their credential due to health problems or concerns.

During the second year, the recruitment process remained the same, but a change in the selection process was implemented. From August to December 1991, Dr. DeVries and representatives from the aerospace companies constructed admission criteria and jointly interviewed potential participants. During these interviews, the workload and the health demands were stressed, and participants were made well aware of the conditions of the job of teaching. Additionally, each company had a limited number of spots to fill, therefore selection was made necessary when the number of applications exceeded the number of open seats.

Another change in the selection process was introduced as a change in the curriculum. Starting with the 1992 cohort, the participants visited several classrooms in the Los Angeles area for observation purposes. These visits were intended to be used as a self-selection tool. Please see the Program Curriculum section above for more discussion of this technique.

The Participants

The program is designed to help retired aerospace engineers earn California certification and eventually enter California classrooms as teachers of math and science. In the first year of the program (the 1991 cohort), the 16 participating Rockwell retirees were an average age of 62 and all were male.

The 1992 cohort, whom we met during our case study site visit, was made up of 17 retirees and one engineer on a leave of absence, all from the four participating aerospace firms. This cohort was slightly different from the first, especially in terms of age, due to changes in the selection process previously described. Their average age was 55 and all but one of the participants were male. The participants were outwardly excited about the prospect of becoming a teacher. Their questions were detailed and displayed a clear anxiety about being in charge of a classroom. From conversations during the case study visit, it seemed that this would be a totally new experience for them, but they thought that they would make an honest try out of it, with most planning on teaching for five to 10 years.

Survey responses indicate that all of the respondents have been married, although some now are divorced. All reported having children, the average number was three. One respondent reported being a member of a minority group.

The educational backgrounds of the respondents were strong, as all reported having bachelor degrees and nearly 87 percent had a master's degree. Eighty percent of the respondents reported working as engineers during their career, and 40 percent noted that they had served as a manager. In addition, one-third of the respondents had been in the military sometime in their career. These men (and one woman) have impressive accomplishments to their credit, such as development of the space station and the Apollo space shuttle--experience that would make a high school student take notice. Unfortunately, this experience does not mean that the participants have strong content knowledge of high school mathematics and science. These engineers have spent decades away from the classroom, and going back to basics appears to be difficult for them. Of the first cohort, half did not pass the mathematics component of the NTE. In fact, during a class we observed, these engineers became quite frustrated by their inability to describe negative numbers and the meaning of movement on a number line in terms that a high school student would understand.

On average, these respondents had a salary of over $83,000 before they retired and entered their teaching program. While the change to a teacher's salary represents a huge decrease in income, it is important to remember that these retirees will be receiving a retirement income on top of their teacher's salary. The financial obstacles that keep other mid-career teachers from completing their degree programs and teaching, or keep prospective students from enrolling in programs, appear not to be problems for this group of engineering retirees.

Over 50 percent of the program participants responding to our survey reportedly entered teaching because they enjoy young people, and 40 percent stated that they felt a social responsibility to enter teaching--to give something back to society for their own good fortune and success. Their conviction that they needed to give back to society came through clearly in our informal conversations at CSUDH, as well. The engineers felt that they had benefitted all of their lives from their education, and now they wanted to help to benefit others. In addition, they are concerned about the United States' position in the world economy--and think that their contribution to the math and science education of our future work force is extremely important. Interestingly, only 13 percent mentioned the love of the subject matter as a reason for becoming a teacher. All of the participants

indicated that they chose to enroll in this program because they were invited to participate and it was the "only game in town".

Faculty

The chair of the education department, Dr. Kathleen Taira, is responsible for choosing the faculty and hired Dr. DeVries to administer the program on a part-time basis. Dr. DeVries is a retiree with 37 years of service with the Los Angeles Unified School District, serving most recently as the Director of Training and the Director of University/College Relations. Dr. Taira's criteria in choosing the faculty were that they have empathy, the ability to relate to anyone, and the ability to keep these students "in line." All of the participating faculty were drawn from the faculty teaching in the regular teacher education program, and these faculty continue to teach in both programs. Dr. DeVries contends that, for the engineers, a practical approach needs to be stressed. He therefore has recruited faculty participation from those who have strong K-12 experience. All of the faculty with whom we spoke enjoyed working with the retired engineers. Nearly all of them were younger than the engineers, presenting a fresh, new view of the classroom. The faculty enjoyed these students' enthusiasm for learning.

Program Costs

The program has enough funds to support 28 people (seven from each aerospace firm). The firms contribute enough money per each participant to cover tuition, texts, and NTE costs. This totaled to about $4,900 per participant for the 1992 cohort. Students do not receive stipends during the year. These students are not financially needy, however, because they are receiving adequate retirement income.

Lessons Learned

Program administrators report that this program, and teaching in general, presents real challenges for task-oriented aerospace employees. "They're used to working in teams, not alone or isolated. There is diversity and unpredictability in the schools, and most of these engineers are unfamiliar with that climate", report the administrators. The students reportedly experienced difficulty in understanding and accepting the impact of selected socio-cultural variables--drugs, gangs, graffiti--upon urban educational environments, and reportedly reacted defensively to contemporary classroom management requirements.

Participants are also surprised by the energy it takes to teach. These people might prefer teaching alternatives other than full-time work in the public schools. Because most, if not all, receive adequate retirement pay, working full-time is not a necessity for them and, in fact, may be a hindrance. If part-time opportunities existed, it is likely more retirees would be interested in teaching.

Some participants dropped out of the program due to health problems or a disinterest in full-time teaching. Program administrators fault their initial lack of adequate selection processes. Administrators decided that they needed to utilize pre-screening interviews that emphasize program rigor, examine readiness, and establish commitment. Additionally, they sought to utilize an initial month to provide intensive observation in area schools, and a chance to withdraw from the program.

These procedures were put in place in January of 1992, showing how quickly program assessment can be used to improve a program such as this.

Half of the first-year participants initially did not pass the mathematics component of the NTE. This has lead the program administrators to schedule NTE preparation earlier in the year. During the first year, preparation was offered during directed teaching, a period of activity in which the participants are already stretched for time. In addition, the NTE preparation class was changed to include more refresher work in specific disciplines. The participants jokingly call this course "Humiliation 101."

In June of 1991, the project was one of 23 that received an award of Special Recognition from the U.S. Department of Health and Human Services' Administration on Aging. This award recognizes companies that demonstrate leadership in the development of policies and programs that are mutually beneficial to businesses and to older Americans.

Update

In Spring of 1994, the program was supporting two cohorts for secondary science and math certification with plans to add one more secondary cohort in August, as well as an elementary certification cohort for non-scientific aerospace personnel. These four programs will be supported by faculty, 75 percent of whom have recent experience in K-12 schools or are currently teaching at the magnet high school that is located on the CSU Dominguez Hills campus.

The program has changed somewhat in regards to financing and student population. Funding for the program is now provided by several of the Private Industry Councils (PICs) in the Southern portion of L.A. County. Their funds are derived largely from U.S. Department of Labor sources, as the federal government has made an effort to provide training, especially for downsized industry personnel. No longer does the program concentrate on retirees, but "downsized" personnel, therefore, a wide range of ages exists, with an average age of about 45. Most of the students have been employed for more than 15 years at their respective firms, but still need to work another 15 to 20 years to provide for retirement. Firms represented in the Spring 1994 cohort include Northrop, Lockheed, Aerospace General, TRW, Rockwell, Hughes, and McDonnell Douglas.

The current program is geared to one semester of preparation and study, with a pronounced emphasis on preparation for the PRAXIS Series Test: The Professional Assessment for Beginning Teachers, which is a new standardized test designed to replace the NTE. Once participants have passed PRAXIS, they may be employed by school districts either as interns or on emergency permits. These two conditions result in base pay, that of a beginning teacher, and carry full instructional responsibility of a typical secondary assignment. Therefore, participants are not required to go an additional semester without income while they student teach.

Mid-Career Math and Science Teacher Preparation Program
Mills College

Setting

Our introduction to the setting of Mills College was notable for its contrasting images. As we followed our map to Mills College, we drove through some areas of Oakland with litter-strewn streets and boarded-up store fronts and then found ourselves traveling along a high stone wall that appeared to guard some mysterious fortress. After driving nearly all the way around the campus in a circle, we found the main gate. Stopping at the guard house, the driver rolled down the window, and the smell of eucalyptus trees flooded the car. This campus was certainly different from its urban surroundings. We were transported into a different place. A place with green grass and stone walkways, shade trees and ivy, and students reading, lazily seated on a stone wall.

Mills College was founded in 1852 and was located in Benicia, then the state capital of California. It was known as the "Young Ladies Seminary." Just over a decade later it was purchased by two educational missionaries, Cyrus and Susan Mills. In the summer of 1871, it was relocated to the "ranchland of the East Bay foot hills," where it stands now: A 135-acre campus in the San Francisco Bay area. The current campus retains much of its early architecture and has a pleasant atmosphere--elegant, yet comfortable. Offices and classrooms at Mills College are housed in older, stone buildings, representing the historical period of its founding. One room in which a class was held even included a fireplace. ´Another feature indicating the gracious style of this institution was the use of actual plates and glassware in the cafeteria, a marked difference from the paper and styrofoam which is generally used at most college and university facilities.

Mills College enrolls about 1,060 students each year, of whom over 70 percent are undergraduates. Over 70 percent of the enrolled students are white, non-Hispanic, and Asian students make up the largest minority group on campus (9 percent). Enrollment is largely on a full-time basis, with over 90 percent of the students participating this way. Mills College is a woman's college, however, males are admitted in the graduate programs and thus comprise about five percent of total enrollment.

The college offers 33 undergraduate and 17 graduate programs and is nationally known for its programs in creative writing, contemporary music, and computer science. Each year Mills College confers approximately 220 bachelor degrees in various liberal arts areas such as letters, social sciences, multi/interdisciplinary studies, and visual and performing arts. Additionally, the college graduates about 80 master's degree students, a great number in the visual and performing arts (42 percent).

The college reports that 75 percent of enrolled students live on campus, and that 20 percent of the students are "resumers"--returning students age 23 and over. The students are also reported to represent 38 states and 28 countries.

Program Objectives

The Mid-Career Math and Science (MCMS) Teacher Preparation Program at Mills College is designed to help address the critical shortage of secondary school science and mathematics teachers in the United States. Mills College looks to recruit students with strong academic and professional backgrounds in the sciences or engineering who are interested in a career change and then provides them with unique pre-professional teacher training. Mills College's goal is to challenge, excite, and realistically prepare these new recruits for successful teaching careers.

The MCMS handbook states that, "We have established our curriculum to prepare our graduates for effective classroom practice based on sound theoretical foundation. For example, we are concerned with:...self-assessment, personal growth and interpersonal skills,...assessment of student needs and capabilities,...establishing and maintaining a climate for learning,...and understanding and appreciating context."

Beginnings

In 1986, the college began teaching mid-career science and math candidates in their regular (fifth-year) teacher preparation program. The faculty soon realized that these students had different needs regarding instruction and preparation. Mills College faculty then applied for, and received in 1987, grant funding of $420,000 from the National Science Foundation to develop the MCMS program over three years (with plans for the first cohort of students to start in fall 1988). This grant supported Mills College to work cooperatively with the Lawrence Hall of Science (a neighboring, nationally-known science museum at the University of California, Berkeley), area businesses, and school personnel to develop the unique program curriculum.

Before the first student cohort began their studies, Mills College, in collaboration with school personnel and staff at the Lawrence Hall of Science, developed several courses for this program, including four content area courses and a year-long, guided, discovery-based methods course.

Program Curriculum

The Mills College MCMS Program is completed in sequence. In addition to the logic of the program and the inherent connection between the coursework and fieldwork, collegiality is a central goal. Towards that end students are expected to enter and complete the credential year as a cohort.

The program is a two semester program beginning in mid-August each year. The three core experiences which engage the students in both semesters are: the curriculum and instruction courses, the subject matter topic courses, and the fieldwork which begins in August and extends until schools are out the following Spring. Students take a fall and spring course sequence that results in a 40 semester hour course load, as outlined below:

<u>Late Summer</u>

Retreat to Mills College-owned cabin for a weekend to build camaraderie
Two-week Teaching and Curriculum course ("crash course" of tools to use in the classroom)
Two-week intensive Topics in Physics course

<u>Autumn</u>

Introduction to the Profession of Teaching
Teaching Reading in Secondary Classrooms
Adolescent Development and Learning
Topics in Chemistry - one half the semester
Methods: Science and Mathematics-Guided Discovery
Social Foundations of Education (optional)
Student Teaching
Weekly seminar to discuss student teaching

Spring

Health Science for Teachers
The Use of Computers in the Schools
Methods: Science and Mathematics-Guided Discovery
Topics in Biology - one half the semester
Topics in Mathematics - one half the semester
Introduction to the Profession of Teaching (second semester - optional)
Student Teaching
Weekly seminar to discuss student teaching

Subject matter courses in biology, chemistry, mathematics and physics (developed collaboratively by Mills professors in science and mathematics departments and San Francisco Bay Area high school teachers) are taken by each MCMS student, regardless of prior subject matter preparation or future teaching intentions. An underlying premise in designing these courses was that much science teaching is too specialized and that scientific concepts and processes should be more integrated at the secondary level. The MCMS courses attempt to remove the barriers that exist between courses by providing opportunities for the students to discover how each of the subjects relates to their own science or mathematics specialty and how it can be integrated for a better understanding of their own field. In fact, each year the program ideally looks to admit four students from each of the four basic science and mathematics fields: chemistry, physics, biology, and mathematics. The program administrators stress that teacher preparation must be revised to prepare teachers to teach integrated science and mathematics. We observed one of the subject-matter courses, and spoke at length with three of the subject matter professors. They had found that their teaching style had changed as a result of teaching their MCMS course. The MCMS students asked more questions as to why they needed to know the information being taught and how they might use the information as it related to other disciplines. In addition, the faculty noted that because these students were training to become teachers themselves, they were very interested in methods of presenting the material (what works? how could the lesson be improved?). Also, these students were more geared toward group learning than other types of students. The faculty also mentioned that the time allotted for the courses did not allow in-depth coverage of many topics, so generalizable lessons were chosen for the course (for example, sets in mathematics and genetics in biology).

In addition, the integration of subject matter is designed to come from MCMS student teachers' interactions with each other. Collegiality, a major construct in the program, attempts to facilitate this. The multidisciplinary cohort of 16 students who study together in the one-year graduate program have a variety of professional experiences in applied technology which utilizes their subject matter expertise in mathematics, biology, chemistry, and physics. Students with more knowledge or experience in one subject area assist those with less knowledge. Although when asked about weaknesses of the programs, a few survey respondents reported feeling group friendships were forced upon them, most participants seemed to benefit greatly from having such a close relationship with their peers. During a luncheon group interview, in fact, students were finishing each other's sentences and using each other in examples of how the program was interesting and mind-expanding for them, demonstrating a depth of understanding of each other that was remarkable. Finally, after several students had expounded on the great depth of knowledge and experienced possessed by the faculty and students as a group, a faculty member exclaimed, "It's a learning orgy!"

The short and long range goals of the program are reinforced by means of a pedagogical course in teaching integrated science with guided discovery methods developed by curriculum experts from the Lawrence Hall of Science and teachers in the Bay Area. By providing teaching models and preparation in cross-discipline instruction, novice teachers learn to link subject matter and design lessons that encourage students to discover relationships and concepts through their own observations and manipulations as well as through readings and demonstrations.

Luckily, our visit coincided with a day when one of the guided discovery classes was being held--a lesson on acid rain. We were included in the lesson, as each participant was required to complete the lab with a partner. (It was interesting to be drawn into the group membership so quickly and we soon regretted not remembering our own high school experience with ph-levels.) The lesson was important, not because the participants necessarily needed to know about the affects of acid rain on the environment, but because they needed to learn how to prepare for, conduct, and rescue a guided discovery lesson. Afterward, students discussed what did and did not work in the lesson, what could be improved, what materials are needed (and where to get them), and the difficulties one might face in setting up this lab. Rarely in teacher education programs is the question of "Where can I get different types of dirt?" addressed as thoroughly as it was here. It was an excellent, yet time consuming, lesson. It lasted one and one half hours but even that time proved insufficient as participants stated that they needed at least one hour for the lesson (a typical class period) and one hour for discussion and critique of the lesson. Unfortunately, because of time demands on faculty and the students, this class is held once every other week.

One of the curriculum and instruction courses was particularly praised by participants and alumni--"Introduction to the Profession of Teaching." Taught by Dr. Ana Richert, this course included the questions "why teach?" and "why do we teach what we teach?" and stressed the importance of reflection and self-assessment.

The development of a reflective teacher practitioner, the long-term goal of the Mills College MCMS program, is facilitated by the MCMS program design. Examples include informal, weekly seminars, journal writing, and regularly scheduled three-way conferences with the master teacher, student teacher, and supervisor. After the students leave the program and begin teaching, reflection is encouraged by means of informal, bimonthly meetings (titled the MCMS Bridge Program). A Mills College master's degree year, offered to full-time teachers, approaches teacher preparation with the same philosophy.

Program participants are in the classroom for one period a day for the first semester and for two periods during the second semester. Participants follow the local school district calendar, not that of Mills College, and student teaching is part of the year-long curriculum (MCMS students are in the schools nearly everyday). They are expected to spend extra time in the morning with their master teacher to help plan and complete administrative tasks. In the beginning of student teaching, participants must shadow a high school student during an entire day which includes going to all of their classes and asking them who is the best and worst teacher and why. By the fourth week, the role of observer has evolved and program participants are expected to be planning and teaching. As the semester progresses, the participant takes on more responsibility until the time when the master teacher, the Mills College supervisor, and the student teacher decide that he or she should take over the class. Student teachers are expected to take responsibility for preparing two class periods during the second semester. Each semester, the student teachers are observed by the supervisor at least 12 times. The program administrators are very proud of this aspect of the program and believe that it

is quite important for the novice teachers to have regular feedback regarding their teaching performance during the year.

Occasionally, during the weekly seminar for discussion of student teaching, students are paired and asked to videotape each other student teaching. We observed one session in which two students showed their tapes and welcomed comment on their teaching style. A lot of discussion was generated upon watching the tapes--participants critiqued others' manners of addressing the students and their body language, and talked of experiences in their own classrooms to help each other find solutions for teaching problems.

Mills College uses the California waiver program for students who have received bachelor degrees in math or science, or have earned enough credits in those areas to count toward the degree, instead of requiring the students to take and pass the National Teacher's Examination (NTE).

Recruitment and Selection

The program administrators report that recruitment activities are centered around advertising, mainly in local newspapers and technical journals. Most students come from the San Francisco-Oakland area but some do relocate to attend the Mills program. The proposal for the original NSF grant stated that the Mid-Career Mathematics and Science Teacher Preparation Program would "carefully" select only those prospective students who could succeed in the classroom. In actuality, there are few explicit selection criteria. Prospective students are interviewed by education and science or math faculty and a public school administrator or teacher, and the candidates are encouraged to talk to current students, visit high school classes, and attend sample college classes. While interviews do undoubtedly deter some students who are not sufficiently interested or prepared, the program depends on self-selection; whoever pays is in. The program needs at least 12 participants to run each year and sometimes it just makes that goal.

The Participants

From fall 1988 to fall 1992, 76 students had enrolled in the program, on average 15 per cohort, with ages ranging from 23 to 61. Half of the participants had been female, and about 10 percent represented minority groups. Survey responses indicate that the average age of the respondents was 41 and about three-fourths were married. About half reported having children, having an average of two children. Coming straight from our observations at California State University, Dominguez Hills, we saw quite a difference in the participating students between the two programs. The Mills College students were much younger and were pursuing their "main" career, a profession that they would depend on for financial security over the next 20 years, however, the engineers from CSU would not be dependent on teaching for their livelihood.

Of the survey respondents from Mills College, all reported having bachelor degrees and about one-quarter of the respondents had a master's, first-professional, or doctoral degree. Career experience was varied for the respondents, with over 23 percent of the respondents reporting that they had worked as engineers during their career, and another 23 percent had worked in the health professions. Nineteen percent described themselves as managers. Other professions included homemaking, social work, and university research. In addition, 8 percent of the respondents had been in the military sometime in their career. On average, these respondents had a salary of $36,000 before they entered the teaching program. For those respondents who had graduated from the Mills

program and are currently teaching full-time in public schools, their salaries went from an average of $29,900 before entering the program to $27,367 as a teacher.

We asked the respondents to tell us why they entered teaching. Fifty percent of the Mills College program participants entered teaching because of an internal motivation such as, "I always wanted to," and 31 percent stated that they wanted to share the subject matter. The behavior of students supported these stated motivations, for example, one student teacher observed during the visit appeared eager to make an impact in the classroom; she wanted to encourage more women to go into science and to "get their hands dirty." She had left her technical position with a chemical company because she "wanted to teach in the real world and to work with others, not sit in a lab."

When asked why they chose the Mills College teacher education program over others, 80 percent stated that they liked the philosophy or focus of the program. Another 40 percent thought that location was a consideration, and about one-third remarked that reputation and the concept of a small cohort group were important in their decision to attend Mills College.

Faculty

Dr. Jane Bowyer, Head of the Department of Education, was the principal force behind the NSF grant proposal and the eventual design of the program. Individual faculty from Mills College departments were invited to participate in the program.

To develop the content courses, the program administrators issued invitations to discipline departments and whoever volunteered to participate was included. Each of these content faculty (math, physics, biology, and chemistry) was paired with a high school teacher of the same discipline. These teams developed the content courses and team-taught the first time the course was offered. All but the biology course, which is still team-taught, are now taught solely by the college faculty.

Program Costs

In 1992, tuition and fees totaled to $7,200 for each student in the certificate program. Approximately 80 percent of students receive aid of some form. The program's administrators indicated that student funding is their biggest challenge. They actively solicit funding, and there is an option for a limited number of students to receive funds through the internship program, being paid for teaching one period per day; at the time of the site visits five of the 11 students were employed as interns.

Lessons Learned

The program has had trouble finding an adequate supply of students. Each year there is a scramble to find enough students for one cohort. While the relatively high tuition plays a part in this (administrators understand the importance of soliciting more scholarship dollars) the program is seeking more successful ways to reach perspective students. Currently, the recruitment process includes sending flyers to Stanford and UC Berkeley Mathematics and Science Departments, advertising once or twice in the Spring in the West Coast *Wall Street Journal*, and in chemistry, engineering, and physics professional associations' newsletters, as well as depending on word-of-mouth advertising. Most students interviewed during the campus visit indicated that they had

investigated the possibility of attending Mills College because of word-of-mouth advertising and the Mills College reputation.

The program administration is continually looking at feedback for ideas to improve the program. Student input has resulted in two courses undergoing major modifications to reflect a more practical, rather than theoretical, approach. For example, students had expressed frustration that the reading across the curriculum and the biology courses did not address tools that they could actually use in their classroom.

During interviews with faculty, we were told that Mills College content area faculty and the high school teachers, who helped to develop and teach the content courses, have reexamined their own teaching practices as a result of working with these students. The students are more aggressive and challenge the teachers. The college faculty are being asked "why" they teach in a certain way and "why not" in another way that they had never considered. High school teachers report that the program has helped them keep up with new topics in science and to appreciate the types of performance expected of their own high school students when they attend college.

One exciting aspect of the MCMS program is that it has been in existence long enough to see the fruits of its labors. Some lessons learned from interviews on campus illuminate problems Mills College alumni may have in their own classrooms. One contact from the Lawrence Hall of Science, who had taught the MCMS guided-discovery course, notes that alumni sometimes have problems in their new departments at the schools--they cannot convince the other teachers to do the guided-discovery experiments that were introduced during the program, and they cannot get the support of the administration for their own implementation of guided-discovery methods. If these new teachers become too frustrated, they may leave teaching. Another obstacle for these newly-minted teachers appears to be student perception of their skills. One participant noted, after reflecting on her student teaching experience, that high school students may be suspicious of your talents and ask, "If you're such a great scientist, then why are you a teacher?"

The program administrators are disappointed by the lack of successful connections to business. Dr. Bowyer notes that the program has had trouble attracting the participation of companies. "We're small...and businesses want to affect hundreds of people...we need to make the case for impact." Program administrators report that, in addition, companies want specific proposals and are not interested in general ideas regarding involvement with schools, therefore it is difficult to get business support at the development level.

Alumni noted that the program needs to strengthen its counseling component, because some of these returning students have not been on campus in decades and currently have no existing support system. However, the program administrators have stressed the importance, and success, of the students working as a cohort to satisfy this need. This has had mixed results, according to the alumni responding to our survey. Alumni report that working in a cohort group was satisfying and "family-like." On the other hand, a couple of participants felt that relationships were forced upon them.

Not all lessons learned are negative. Many students leave the program prepared to function as change agents as was expressed to us by alumni in interviews. One alumnus wrote grant proposals and was able to purchase 10 computers for her classroom; another sees herself as a model to other teachers--she uses cooperative learning, hands-on experiments, and integration of subject matter--and kids seek out her class. The two alumni that were invited to speak with us clearly expressed their commitment to classroom teaching, as opposed to climbing the administrative ladder.

One intends to research how girls achieve in mathematics and science and the other would like to work on teaching techniques and curriculum development in mathematics.

Update

Program administrators have reported that with an increased number of applicants, the program no longer has problems enrolling students. Cohorts now consist of 18 to 20 students. Additionally, a new director was hired (the previous director moved to another position within the department). This new director is a minority group member, and this change may alleviate the claim by some alumni that the program lacked diversity.

Crystal City Secondary Teacher Education Program
The George Washington University

Setting

The heart of Washington, DC is host to the George Washington University, a large private institution with a strong tradition of undergraduate and graduate education. The university is located in downtown Washington, D.C., easily accessible by the subway and bus systems, and just a short walk from the national museums and monuments. The university enrolls about 19,000 students each year, over 80 percent of whom are white, non-Hispanic, and about 55 percent male. Fifty-three percent of all students attend full-time. Non-resident aliens make up nearly 14 percent of the student body. The George Washington University has a strong graduate school component: 11,615 students are in graduate programs, representing 60 percent of the total headcount.

Each year the university confers approximately 1,500 bachelor degrees in various disciplines, with about half being in business and management and public affairs. Additionally, the college graduates nearly 2,000 master's degree students, most in business and management (37 percent). Doctoral programs are available in education, engineering, business and management, and several liberal arts areas. Also, the university grants first-professional degrees in law and medicine.

Program Objectives

The Crystal City Program, named for the nearby off-campus Virginia location where classes are held, prepares professionals whose primary undergraduate degree is in liberal arts or in a field other than education to become qualified secondary classroom teachers of art, English, foreign language, English as a second language, mathematics, science, and/or social studies. The program provides teacher candidates with a basic understanding of philosophical and sociological foundations underlying the role and organization of public education in the United States, with emphasis on diversity and multicultural issues, along with:

- Theories of learning, teaching and human development in the context of formal and informal education;
- Teaching techniques and skills;
- Theories and strategies of classroom management;
- Utilization and development of curricular materials;
- Assessment techniques used to evaluate student achievement;
- Principles, processes, pedagogy, and research in education; and
- The importance of a blend between theory and application.

Beginnings

The George Washington University recognized the potential of a program to prepare separating military personnel as science and mathematics teachers, and in 1985 initiated the "Secondary Teacher Certification Program--Teaching Math/Science as a Second Career." At the time, the Washington area was reported to have the fourth highest concentration of retiring military personnel in the United States and was believed by program administrators to have the highest concentration of separating military officers. At the same time, there was another group of students

attracted to the part-time program, a more heterogeneous group of professional workers who were interested in changing their careers.

The orientation of the program was originally toward obtaining certification as an asset for individuals who were temporarily located in the Washington, D.C. area. The portability of the certificate was ensured by the accreditation of the program by the National Association of State Directors of Teacher Education Certification's (NASDTEC) Interstate Reciprocity Agreement.

Because the potential students for such a program were likely to be employed full-time, the program was designed to operate part-time--weekday evenings year-round. The Department of Teacher Preparation and Special Education (DTPSE) in the Graduate School of Education and Human Development (GSEHD) has a tradition of developing innovative full- and part-time teacher training programs with local school districts. There were four such programs running when we came to visit the Crystal City location: Fairfax Transition to Teaching Program, Returned Peace Corps Volunteer Program, the Crystal City Program, and the Model Graduate Program in Secondary Education, a campus-based fellowship program.

The Crystal City Program is administered through George Washington University's Division of Continuing Education, now called the Division of University Programs (DUP). The site chosen for the initial cohort was a suite of classrooms in an office building in Crystal City, Virginia. At the time, the center for U.S. Naval Command was in Crystal City, and the proximity to the Pentagon--two subway stops away--made the program's location ideal for part-time evening attendance. The Pentagon permits George Washington and 10 other area universities to present briefings about their educational offerings at specific times in the building.

During the period we were visiting the Crystal City Program, The George Washington University Hampton Roads Center, also administered by the Division of University Programs, was offering a Teacher Certification program in math and science and a Master of Education program with the same concentrations. This program option, which no longer is in existence, was successful in attracting active duty military as well as those separated or retired due to its proximity to a number of military installations of all the services. The curriculum encompassed the same components as the Crystal City Program and the program coordinator of the Crystal City program was the liaison from the Graduate School of Education and Human Development to the Hampton Roads location.

At the time of our visit, the program was being administered by a regular full-time assistant professor within the Department of Teacher Preparation and Special Education, Dr. Sharon Lynch, for whom the program coordination was equal to one-third of a normal teaching load. Dr. Lynch submitted a grant proposal to the Mid-Career Teacher Training Grant Program of the Office of Educational Research and Improvement to support administration of the program, a research assistant to do evaluation and demographic research on program participants, and to support a number of student participants with scholarships (twelve were awarded over the two years of the grant). The grant was awarded and the program cohorts from 1991-1993 were the beneficiaries of the additional support. Scholarships of $3,000 were made available for students when they were to begin their student teaching internships. The student cost of earning these credits was $2,000 and most individuals had to give up their jobs or find work part-time to maintain their earnings during this 12-week, full-time internship. Students wrote essays of application regarding the stipends and an advisory group, developed as a condition of the grant and consisting of the program coordinator, dean of the Division of University Programs, alumni of the program, and teachers within cooperating schools, made the funding decisions.

The program has undergone some important changes since its inception in 1985. By 1990, demand had increased from the nonmilitary sector. The program was expanded to accommodate students wishing to earn certificates to teach in other disciplines. This required an increased involvement of faculty who were the content area experts in the department. The university gave its full commitment to the Crystal City program by making this the only part-time secondary education option. Also, although the program was conceived as a fast-track certificate program, many military participants were able to meet content standards which allowed them to begin the certification core courses with accompanying school-based field experiences. The program faculty and coordinator wanted to encourage the completion of a master's degree and by 1990 were able to get agreement from their own department and the DUP that all Crystal City students be admitted as master's degree students. This allowed the program to offer some of the graduate courses at Crystal City, where they would be less expensive and therefore serve to improve student retention.

Approximately 25 to 30 students are enrolled in each of two cohort classes per year. One begins in the fall and one in the spring of each academic year. The students are moving along the program requirements on different tracks, though, depending on their content preparation and field experience. For example, those students who were hired on emergency or provisional certificates by school districts and had from one to two years to complete their certification requirements were among the cohort participants in the Crystal City program. Therefore even though the group is called a cohort, students are unlikely to have the same group of peers in class after class. Within a given class, students are mixed in terms of their in-school and program experience. In an educational foundations course, for example, there may be provisional students, students who are making up content area courses, and students who have completed their internships.

After the external funding was received, the university agreed to support a full-time coordinator for the GW project who would also carry teaching responsibilities. Dr. Corey Hanson, a recent doctoral recipient was hired following a search. By 1993, concern about the student pool emerged as changes in the location of nearby military installations were announced by the Department of Defense. Nevertheless, the program was able to maintain a consistent contingent of students enrolling in the fall and the spring of that year, about 25. The addition of management and research staff through the Department of Education grant was considered to have a positive influence on the cohesion of the curriculum and the retention of students.

Program Curriculum

In its first iteration, the program was developed as a fast-track to teacher certification. A 24 semester hour core of courses was offered at the Crystal City Education Center. If students wished to earn a master's in education as well, they were required to complete 12 additional semester hours of courses, generally offered on the Washington, D.C. campus. The entire sequence of courses permits program completion in about two years.

The Crystal City Secondary Education Program, as it has developed to its current state, reflects traditional teacher preparation course content. The teacher education programs at the George Washington University have been reviewed and accredited by both NASDTEC and the National Council for the Accreditation of Teacher Education (NCATE). The curriculum is assessed continually by the department faculty with an eye toward the latest research findings about teacher preparation and structuring early field studies and the student internship. The program administrators recommend to students that the certification courses be taken in the following order:

- Teaching and Learning I and II (6)
- Methods Course in the Content Area (3)
- Social Foundations of Education or Contemporary Issues in American Education (3)
- Reading and Writing Across the Curriculum (3)
- Development and Diversity (3)
- Professional Internship in Secondary Education (6)

The "Teaching and Learning" courses provide an overview of the principles of teaching, learning, and related research. Through readings, class sessions, micro-teaching experiences, and assignments, students explore ways of knowing, models of teaching, and the dynamic nature of the teaching/learning process. Planning, instruction, classroom management, and evaluation are related to research theory on learning. Thirty hours of observation in a secondary school are required. Alumni reported to us that those first 30 hours of observation was one of the best parts of the program; it had been a long time since any of them had been in a classroom.

The "Methods" course includes 30 hours of observation arranged by the Office of Laboratory Experiences. Each student takes a methods course(s) in the content area(s) for which they wish to be certified. These courses are offered on campus to keep Crystal City students in contact with full-time students currently participating in other teacher preparation programs.

"Social Foundations of Education" examines the relationships between school and society, the social, economic, and political purposes of schooling, as well as forces that shape policies and school curricula and contemporary issues and their implications for the future.

"Reading and Writing Across the Curriculum" is a whole-language approach to structuring classroom curriculum including strategies for developing students' reading and writing skills while studying literature, social studies, foreign language, English as a second language, art, math, and science. Students are asked to consider how they might adapt their subject, methods, and curricula to include writing, and to account for differences in reading levels within the classroom. The material in this course is specifically required by state boards of education for teacher certification.

The Development and Diversity course addresses meeting the needs of both special-needs students in the regular classroom, as well as the needs of the diverse population present in today's classroom. Students are asked to consider how they might adapt their subject, methods, and curricula to this variety of population. The material in this course is specifically required by state boards of education for teacher certification.

Before being given full admission to the Crystal City Program, candidates are screened for successful achievement of courses required by NASDTEC for secondary teacher certification. Content area deficiencies can be fulfilled at other institutions, including community colleges. One student recently admitted to the program reported having to complete seven courses prior to beginning the teacher preparation requirements. Typically students are put in an "inactive" status until within fewer than four course credits of fulfilling their content area requirements. Staying in the program requires continuous registration.

There are two aspects to the practical experience planned for students in the Crystal City Program: the 60 hour field experience and the student teaching internship. A field placement coordinator makes all arrangements with the eight school systems cooperating with George Washington University. Students are required to engage in 30 hours of observation for the "Teaching and Learning I" course and 30 hours of observation as part of each methods course taken.

Each observation experience carries with it a set of written requirements. For example, in the Psychology of Learning course in which we observed, students were asked to write down descriptions of each observation in a log which was required to be turned in at the midterm and at the end of the class. A complementary supervisor's evaluation was also to be turned in as part of the assessment of this observation experience. For the student's part, he or she was to demonstrate the "application of the concepts, principles, theories learned in class to actual classroom activities." Thus each entry in a log would contain a description of the in school activity in which the student observed or participated, a record of observation of students, the instructional climate, aspects of management and discipline, good ideas of teachers, and assessment of the accomplishments of the period or activity observed. These objective and subjective comments were to be accompanied by self-assessment and feedback as to how the observer felt during the observation. All of this was to be accomplished with no prior training about observation techniques by the faculty member.

For the methods course, for example Teaching English in Secondary Schools, five specific assignments were given to students: (1) observation of a literature discussion, (2) observation of writing instruction, (3) reading/grading of a set of student writings, (4) interview of an in-service English teacher, and (5) survey of district language arts curricula. This assignment was not restricting students to observation, but asking them to assist the supervising teacher as requested, work with individuals and small groups of students, and if suggested by the teacher, try teaching a lesson or portions of the lessons.

The student teaching internship of the program includes two separate teaching experiences, a four-week and an eight-week session. For many students, these internships involve one setting in a middle school and one in a high school, or if the student is seeking dual certification, he or she will teach one of the subjects for the four-week session and the other during the eight-week session.

In 1993, the program coordinator piloted clustering of student interns. Six of the interns from the Crystal City program were selected based on interest. They were registered as substitutes, thus making them eligible for tuition remission and to assist their cooperating teachers. The clustering and locating of supervision and cluster meetings in the school made for a different relationship among the teacher-interns, the cooperating teachers and the supervisors in the following ways: first, the teachers could take a substitute assignment for the intern so the intern would not have to leave his or her assigned class; second, the weekly seminars could include interns and cooperating teachers and be held in the schools and the topics could be school-specific issues; and third, there was a more supportive relationship built among the interns who were in the same school and meeting together. Finally, the supervisor could spend less time traveling all across the county(ies) to different schools to see students and more time observing and providing feedback. The administrative difficulties of arranging this clustering were challenging, relying on the application of students for student teaching and school selection as prerequisites. The effort is being considered again but is not currently being done.

For students not participating in the clustering effort, weekly seminars were held at the Crystal City location. These seminars involve topics of the students' choosing--if they are having trouble with classroom management, the students can choose to concentrate on that for one session--and they provide one of the only opportunities for the students in a particular cohort to meet together.

As a part of our effort to learn about the students, we attended the first session of the student teaching seminar. Each of the 10 student teachers were present and although all cooperating teachers were invited to attend as well, three came to this seminar. The students spoke about their first days student teaching in the classroom in between eating brownies and potato chips supplied by the

program coordinator. In addition, expectations of the students' internship activities were addressed. The cooperating teachers had already received a handbook describing the student teaching internships and the expected outcomes.

Assessment of students tends to be through traditional methods, that is the writing of book reports, writing results of field observations, and in-class tests, group presentations. However, beginning with the fall cohort in 1994, the program coordinator plans to institute a portfolio method of alternative assessment. All students have been asked to keep two pieces of evidence of their coursework or the classroom experience and collect these in a portfolio. An alum speaking to this new cohort provided the perspective that the portfolio was a great way to look back at what one had accomplished. Another alum provided the opinion that for teachers and prospective teachers maintaining a collection of their work was essential and a natural process. While his cohort did not apply the portfolio idea per se, he developed the habit of keeping "good idea pages" for himself so he could go back and see what worked and use it again.

All Crystal City Program participants must pass the National Teachers Exam or the new version of the Educational Testing Service exam, called PRAXIS to meet District of Columbia requirements to teach. If students do no wish to be eligible for reciprocal licenses in states where NASDTEC standards are currently used, they may elect to take the old NTE. Students make their own arrangements to take the exam. Military officers counseled each other to take this before leaving the military because the cost would be covered.

Recruitment and Selection

Students are recruited into the program by several methods, including literature made available to visitors on campus and other such traditional methods. A special effort is made as well, to attract retiring military personnel by making presentations at the Pentagon and advertising in Pentagon newsletters. All students applying to any of the four separate secondary education programs at the university participated in both group and individual interviews. In the group setting, the program coordinator and faculty posed questions regarding education issues and candidates' goals and attitudes. When they came in for the interview, candidates were also asked to write a sample essay in response to an education problem. Following the group interview, candidates met for more extensive discussions with the program coordinator and the faculty members who will be their content area advisors. The candidate's undergraduate and graduate transcripts were examined to determine if any content area deficiencies exist.

We also were able to observe the interview process. The group interview we attended included seven applicants and two interviewers, one of whom was the coordinator of the Crystal City Program. The applicants were asked to introduce themselves--all were relatively young, with the oldest having graduated from undergraduate school seven years prior, and had varied professional backgrounds from relatively little to several years in, for example, law research and environmental consulting. The interviewers then asked the group to engage in discussion regarding the following questions:

- What are adolescents and secondary schools like?
- What are the different roles of the teacher?
- What is the profile of an excellent teacher?

Discussion was lively, but with several people obviously leading the discussion or "teaching" the others. Some of the applicants apparently had very little experience with high school since their own attendance. In fact, one applicant who "wants to be a coach" said very little except "isn't there a lot of violence in schools?" Their final profile of an "excellent teacher," however, was impressive: a person with strong content knowledge, enthusiasm, the ability to make learning enticing, an understanding of the students individually, and high expectations.

The interviewers then went on to describe the four teacher preparation programs offered by the university: Fairfax Program, Peace Corps Program, Model Graduate Program, and the Crystal City Secondary Education Program. Applicants were asked to consider which program(s) would be right for them and to relay that information to the content advisor during the individual interview.

The individual interviews consisted mainly of a review of undergraduate and graduate transcripts to determine what additional coursework, if any, might be required of the student. We sat in on an interview of a student wishing to get certification in social studies and hoping to enroll in the Crystal City Program. He was currently doing patent and trademark legislation research and wanted to continue to be employed while he worked toward certification. The social studies advisor noted that he would need to take at least two more courses at the undergraduate level in either geography, economics, or history. They decided that he could take those courses at a community college over the summer. The advisor also asked some additional questions of him such as, "What is atypical about you?" and "Have you had any experience in teaching?" and "Is there anything else you'd like to add?" His answer to each of these questions was either "Nothing" or "No." She concluded the interview by stating "I will pass your folder on as approved for acceptance."

With an applicant's group interview performance, the review of transcripts, and an essay written on issues relating to secondary school teaching, the admissions committee looked at each applicant and tried to match them appropriately with one of the four programs.

The program coordinator reported that sometimes, in the group setting or the individual interviews, candidates reveal themselves as unsuitable for teaching, or their answers indicate they have not given careful reflection to the issue of mid-career change. We are told that when this occurs, the program coordinator or faculty members are likely to advise that the students explore today's schools further, or they counsel such individuals in another professional direction.

The Participants

Program administrators of the Crystal City program indicated to us that the students enrolled in what they called the Tidewater program (Hampton Roads Center) seemed to be very similar to the Crystal City participants and requested that we include them in our survey of all program participants. This was done. We received 18 responses from the Tidewater alumni which were added to the responses from the Crystal City participants. While data from the Hampton Roads Center is sketchy, it indicates that a total of 61 individuals participated in the program during its existence. Eighty percent of these were males. The median age was 40 and 77 percent of the individuals were on active duty when they were students in the program. All the military services were represented in this population but the largest group--64 percent--came from the Navy which has the strongest presence in the geographic area.

The Crystal City program targets 30 new students per cohort, with cohorts beginning in the fall and spring of each academic year. Over 200 students have enrolled in the program. Our survey results indicate that nearly 90 percent of the past participants have been male, and about 2 percent

represented minority groups. The average age of the respondents was 44 and about 80 percent are married. About three-fourths reported having children, with each having on average two children. It is important to note that the program has modified its target population since its beginning, therefore, it is likely that as time goes by, the overall picture of the Crystal City Program alumni will show greater representation of women and be younger.

The educational background of the respondents was extensive. All reported having bachelor degrees and nearly 66 percent had a master's or first-professional degree. Seventy-two percent of the respondents reported they had worked as military officers, and 24 percent had served as managers or administrators. An additional 14 percent indicated that they worked as engineers during their career. Other professions reported included aviation, graphic arts, and museum curator. On average, these respondents had a salary of $55,764 before they entered the teaching program. Previous teaching experience included training others as part of their job responsibilities and tutoring on a volunteer basis, as well as teaching at the college level.

The survey questionnaire asked the respondents to state why they entered teaching. Forty-three percent reported entering teaching because of an internal motivation, writing "I always wanted to," and 42 percent indicated that they felt a social responsibility to teach. An additional 29 percent stated that they enjoyed working with kids. Additionally, when asked why they chose the George Washington Crystal City Secondary Education Program over others, three-fourths stated that location was an important consideration.

These students, especially the retirees from the military, were not going into the teaching profession for financial rewards. In fact, when one alumni was asked how other military colleagues viewed his going from a high-paying "respectable" military career to a relatively low status teaching job, he exclaimed "Of course the real question is 'do I care?' I've had all the status I need in my naval career and that part of my life is behind me. It was great to have status, but I'm at a point in my life where the retirement income I get supplements the teachers pay, meager as it is, very nicely so I can enjoy the same style of living that I was. I don't have a lot of big demands for money, I don't have a lot of need for status." He now wants to solve some of the problems present in the current educational system and claims that "by virtue of my experience, maybe I can do a little bit better job."

These new teachers will bring different ideas of how to run an educational operation to the schools. Some alumni talked about student learning standards, or the lack of, and stated that "if industry can do it, why can't we?" Industry professionals are expected to learn how to do their jobs and are told what those needed job skills are. In the schools, however, these new teachers have found that there is no list of "Ten things a physics student must learn." Additionally, these new teachers do not want to be held on a short leash. Agonizing over the fact that mathematics teachers are required to move through the curriculum in a lock-step fashion, so that everyone spends two weeks on conical math for example, alumni stated "if this is going to be a rewarding career for us, we're going to need to have some maneuvering room."

Program administrators note that the mid-career changers in the Crystal City Program have dealt extensively with large bureaucracies. Many are currently employed as managers, and most have participated in higher education studies at several different venues. Consequently, these students are sophisticated consumers of an educational "product" and hold fairly high expectations of an institution that is receiving their tuition dollars. More than once in our discussions with educators who work with second career teachers we heard that the typical attitude of these mid-career changers toward their teacher education program can be summed up as "does not suffer fools

gladly." The students expect high caliber, well-managed programs.

One faculty member in the Crystal City Program notes that, while on the whole former military officers make excellent teachers, some problems are evident. "These people have deficiencies, though, in education content and in realizing the realities of school systems, especially those in inner cities." In fact, of the alumni with whom we spoke, most indicated that before entering the program they thought that they could teach with little or no training, and believed that the education courses that they were required to take would be "Mickey Mouse." In retrospect, they now appreciate those courses and remark that teaching is not as easy as it appears on the outside.

Not only do these students need different preparation in light of their unfamiliarity with schools, but the first program coordinator noted that these new teachers will need a different support structure once in the schools than is currently provided to first-year teachers. "Age and maturity are seen as a benefit. There are staff development implications, though. These people need different things in the first year." According to one alum who is now in his second year of teaching, "every two weeks something will happen to make you want to come back." The research on second-career teachers shows that these individuals, though mature as experienced professionals, do not experience their new teaching job as experienced teachers but as novices, and this is often overlooked by the school, their colleagues, and the programs from which they have graduated. Support in their induction year is still needed. Contrary to what might be expected, second-career teachers are unlikely to transfer their knowledge from their first profession to the teaching setting because of a combination of pressures; such as, being overwhelmed by the students' educational and social needs, feeling constrained by the hierarchy within a school, and being focused on accomplishing their teaching objectives (Madfes 1989, 1991).

Although we did not follow students from class to class because of the nature of the program, we did observe in classes and speak with students and their concerns about the pressures on teachers were real and concrete. For example, during an orientation held for the fall 1994 cohort, the director of the Office of Laboratory Experience presented new and returning students with some of the goals and dealt with some of their expectations regarding being in school. After introducing the notion of school reality and teacher flexibility, she asked her audience what they were thinking. The response was overwhelming, in terms of individuals trying to relate what they knew and felt about schools to their prospective role as a teacher in school. More questions than reflections, some of the responses were: "why won't it work to lean on what we know from our former teachers?" "Why are kids' situations so different now, or are they?" "How do we know if kids are learning?" "How can we use what students can teach us?" "What do the people inside school think of school?"

In this orientation session, the dean of GSEHD spoke eloquently about teaching as a profession and reminded the new students that the most valuable tool they could develop in the program is that of being in touch with themselves as a learner. He assured them they would be able to take what they had learned in class, log it so it becomes intuitive and will be available to them, along with the practical experience of being in the classroom as an intern and then as a teacher.

Faculty

As in any university, there is change among faculty both tenured and nontenured. This program also changed coordinators three times in the past four years. The original coordinator only served in the position part-time. A full-time coordinator was subsequently hired, however, he was forced to resign due to health concerns. The new coordinator, who was hired in 1994, came from

the local school system and was familiar with the faculty and the students. The Crystal City Program is managed by a full-time program coordinator and involves five faculty members and at least one research assistant. The program coordinator also holds the rank of assistant professor. The five faculty are responsible for the methods portion of the professional preparation program and serve as advisors to students in specific content areas. Adjunct faculty from the schools and from the educational research community teach diversity courses, reading and writing in the content area, educational foundations, and psychology of education.

Program Costs

The program costs approximately $1,000 per three credit course, which adds up to $8,000 for the program (excluding any stipends or benefits). The typical undergraduate tuition for the George Washington University is closer to $17,000. The off-campus location allows the university to charge less per credit hour for Crystal City courses. Individuals who are qualified and registered as substitute teachers may request a partial tuition award for off-campus courses only. This represents an additional savings of 25 percent of the full tuition rate.

Lessons Learned

The Crystal City Program operates within a school of education which seeks good working relationships with the school districts it serves and is known for its innovative efforts to address the needs of both its students and the school systems. The faculty have a sensitivity to adult learners and their experience with this and other nontraditional programs allows them to accept the Program as another avenue for access to teaching. The faculty are supportive of each other and this helps eliminate many of the institutional barriers that other nontraditional programs face. The dean is supportive to the extent that he has attended orientation sessions, has encouraged the integration of the part-time program participants with the other students participating in the courses and programs offered by this school of education. The school just moved into a newly renovated building on campus in Washington, D.C., and the faculty plan to host regular Wednesday coffees to encourage all students to come onto campus and meet with their peers and with the faculty. Finally, a newly hired program coordinator has pledged that as part of her responsibilities she will keep all students informed and bridge the full-time and part-time communities with opportunities for faculty to meet, for program participants to meet and with a newsletter.

The relatively low tuition contributes to the Crystal City Program's viability. The off-campus tuition costs are just a little over half of the on-campus rates. Similar programs are offered by other colleges and universities in the Washington area (although GW was the first institution to design a program specifically for this population), and GW must compete with them by offering a program of studies of the highest caliber while keeping tuition costs reasonable.

One additional area of learning for this nontraditional program was that of the necessary cooperation required between the academic department and DUP. Both organizations within the university had to come to some agreement about registering, counting, and monitoring the progress of the students. In most other alternative programs these responsibilities remain with the school of education.

According to the first program coordinator, while the first efforts for the Crystal City Program were successful in terms of attracting the military population who wished to teach math and

science, as in other alternative programs there was relatively small student enrollment. Students and faculty lacked some cohesiveness due to the program's part-time, evenings-only schedule and the relatively transient nature of the student population who stopped and dropped out according to shifting career plans and assignments. Initially, the university's commitment to program administration was limited, and there was a great need to provide better management of the educational aspects of the program. Moreover, there was no system to follow the progress of students admitted to the program, since the university record system tracks only those candidates in degree programs, and did not include the original 24 semester hour teacher certification program. Consequently, it was difficult to know exactly who was in the Crystal City Program; what happened to those who completed it; or why some students dropped out.

Many students, especially the older participants who in their first career were more removed from the educational system, begin the program underestimating the difficulties involved in teaching. Because these part-time students must quit their jobs or arrange leave to complete the student teaching internship, some of them are "lured away" by full-time paying teaching positions in the schools on emergency certificates and do not finish the academic program. In this way they do not have to stop working and they avoid the supervised student experience which they imagine is "below" their level of maturity and knowledge. However, the faculty at GW believe strongly that most students cannot handle, physically and emotionally, the rigors of teaching on a full-time basis without the aid of a cooperating teacher. Therefore, as in other alternative programs, the faculty remain steadfast on the requirement to student teach and offer support through both the program faculty and the Office of Laboratory Experiences with supervisors who are experienced in school settings and whose graduate education has prepared them to address the most current curriculum and instruction issues. The schools are partially to blame for this problem, however. According to the GW faculty, "The schools are capable of abusing these students, too. They are seen as a panacea--without need of training. The Crystal City students get lured into jobs before they finish the program. They might get burnout quickly if they work their first-year without adequate preparation."

One of the alumni with whom we spoke was able to begin his teaching career part-time. He taught two sections of physics at a high school and thought that this was an excellent way to learn how to teach--he had enough time to plan his lessons, grade papers, and most importantly, watch other teachers. Many of the students had other in-school (learning setting) experiences to report while they were taking classes in the Crystal City location. These included working in a summer camp, tutoring in a laboratory school for learning disabled students, and substitute teaching. All however looked to the program structure and faculty to provide the tools they would need once they were in charge and responsible for their own classes. The challenge of the Crystal City Program was to work with this variety of recent and current experience.

Project Promise
Colorado State University

Setting

Project Promise is a full-time certificate program for prospective teachers located at Colorado State University in Fort Collins, Colorado. Fort Collins is small city, north of Denver, at the foot of the majestic Rocky Mountains. As one drives parallel to the city towards the other small towns of Loveland and Berthed, the peaks and well-known trails of the closest range of the mountains are visible from the road. The city's farmlands have become picturesque community parks and some of the old farmhouses, now renovated, are homes to young couples working in Fort Collins or nearby towns. The geography of the town and its environs holds a considerable folklore. The river, Le Poudre, was the location for a hidden stockpile of gunpowder owned by mountain men and has given its name to one of the local school districts with which the project works in training and placing student teachers.

To reach Fort Collins from Denver, one must drive north from the airport for about an hour. I took an airport jitney. This gave me a chance to see the geography of the area and hear what people had to say about their reasons for going to Fort Collins, as a clue to what to expect. In fact, my fellow passengers included both students and faculty as well as residents returning to the city and they informed me that once you have lived in Fort Collins you have little interest in living elsewhere. Those who change jobs as well as graduating students find ways to remain in the area. It is easy to see why, from the geography and the small community feeling engendered by friendly neighborhoods and parks. Given the proximity of local housing to the university and the relatively low volume of traffic on the town's main street, it is not surprising to see students living on and off campus rollerblade to classes early in the morning. There is only one chain hotel in the city, the Holiday Inn. Many visitors stay in bed and breakfasts or in an older local hotel, an institution of the community. The typical commercial areas exist on the edge of the university with fast food restaurants and small strip shopping centers, but the focus of community commercial activity is a quaint redeveloped town center with a variety of restaurants and shops to appeal to students, parents and visitors. Bed and breakfast inns in restored Colorado homes are popular with business people and students alike. A local Italian restaurant has specials on Tuesday evenings that take prices back to the 1960s, for example, spaghetti for $1.50. While the primary location of activity revolves around the university campus, there are other significant local employers, including a number of small school districts, Hewlitt Packard, and a large hospital complex, drawing traffic to other areas of Fort Collins and neighboring cities.

Colorado State University enrolls about 27,000 students, 73 percent of whom are undergraduates, and 70 percent of whom participate on a full-time basis. Over 90 percent of the CSU students are white, non-Hispanic, and the distribution of men and women is about equal. Non-resident alien students make up less than 3 percent of enrollment. At Colorado State University about 7,000 students are enrolled in graduate programs, representing 26 percent of the total headcount.

Each year the university confers approximately 2,900 bachelor degrees in various disciplines, with about one-third being in business and management and social sciences. Additionally, the college graduates nearly 800 master's degree students, most in engineering and business and management (23 and 19 percent, respectively). Doctoral programs are available in engineering, life sciences, physical sciences, education, and several liberal arts areas. Also, the university grants first-professional degrees in veterinary medicine.

A land-grant university, CSU has a strong agricultural research and development history. The School of Occupational and Education Studies (SOES is a merger of the Vocational Education and General Education departments) resides within the College of Applied Human Sciences. Education is a small program: 25 to 40 students graduate from the master's program in a given year, and 25 to 40 complete the Ph.D. in vocational education.

Program Objectives

Project Promise takes its name from the philosophy of its co-founders: **Pro**fessionals with a **M**ission in **E**ducation. The mission statement reads:

> Our mission is to provide a research-based, field-experience driven program where prospective and experienced teachers can, through quality instruction, modeling, and coaching, learn, develop, practice, and refine the knowledge, skills, and attitudes essential for becoming teachers who are strong, able, caring, effective professionals capable of meeting the difficult tasks of creating effective learning in America's classrooms.

There are seven goals related to the recruitment, preparation, support, evaluation, and placement of the candidates. The SOES at CSU is a Holmes Group member. The Holmes Group is a consortium of institutions with teacher education programs whose deans have agreed to a set of principles for reforming teacher education and for improving schools. These principles--which demand solid knowledge of subject matter, tougher and more appropriate screening and assessment, education studies at the graduate level, education curriculum grounded in research, and more productive clinical experiences--are then put into practice at the member institutions. The organization is an advocacy group for its reform agenda and it awards occasional grants for program and curriculum change.

Project Promise has adapted the Holmes group reform goals to its mission and the needs of its participants and client schools as follows:

- Recruit 15 to 20 highly motivated and capable individuals from professional and technical backgrounds with at least a bachelor's degree and significant life and work experience related to the academic area in which they would teach;
- Provide a highly experiential program for these highly select candidates;
- Build a program around the best that is known from current research;
- Provide regular and systematic coaching and feedback sessions that encourage the implementation of smaller bits of theory with immediate feedback in a teaching/work situation;
- Provide for three objective evaluations of student teachers by an external evaluator;
- Facilitate an extensive job search process that would invite school districts from the state of Colorado and others upon request (two school districts from California and Florida requested an opportunity in 1990) to interview candidates from Project Promise; and

- Provide mentoring and follow-up to the candidates within the state (and out-of-state, when possible) through regular conferencing and coaching sessions at their place of work.

Beginnings

Project Promise was conceived by CSU professor Robert Richburg, who was interested in and considering the establishment of a nontraditional program for prospective teachers. He and one of his doctoral students, Sharon Carson, who had spent almost 20 years in the schools as a teacher, teacher trainer, curriculum specialist and administrator, developed the program idea and were able to get a small amount of support for planning and outside evaluation from the then-Director of the SOES.

Carson's research area, identifying the characteristics which would predict a good teacher, became important to the formulation of the selection process of the program. Project Promise went forward in the fall of 1989 with the two teacher educators acting as both directors and faculty aided by a graduate assistant (at CSU, a faculty assistant).

While the university had indicated its philosophical support for the program, there had been no guarantee that the financial resources would be there every year and the program institutionalized. Despite her multiple roles as co-director, instructor, and supervisor of student teaching, Dr. Carson was not given faculty status. Instead, her position was evaluated from year-to-year. By the time I visited in the spring of 1992, however, the future of the program was looking brighter. With the arrival of a new dean of the school of education, a strategic planning exercise had been undertaken by the faculty, and the need to serve adult students with such a program was established as a high priority. While faculty concern about distribution of workload remained a stumbling block to the institutionalization of the program, there continued to be support for Project Promise from university administrators, including the president. The just-concluded (within the year) accreditation review by the National Council for the Accreditation of Teacher Education (NCATE) pointed to the program as a jewel in the crown of the unit. This added lustre to the program's already documented success, as reported by its students.

Program Curriculum

The hallmark of Project Promise is its cohort experience, in which academic content (the core courses of education methods, social and psychological foundations, special needs of students, and multicultural issues) is merged with in-school experience. This avoids the fragmentation usually found in the traditional undergraduate program. At any time during the program experience, the students are together in some courses, and at the same time, participating in their field placements.

While the delivery of the curriculum is nontraditional, it has been approved by the university and it meets the standards of both the school of education (SOES) and the state certification authority. The course of study is not divided into typical semester hours of work, it is inclusive of all students need to take and is equivalent to 18 hours per semester. However, students in this cohort would have difficulty trying to transfer to another program because of the nontraditional nature of both the curriculum and the assessment process.

Another distinction of the program is its assessment philosophy, that is, no grades are provided to students, however there is continuous feedback. For each academic and field

experience, the faculty and students engage in a "processing" activity, addressing the development themes of Project Promise: understanding self as person and as teacher; understanding students as individuals and as learners; understanding the instructional process and "those teacher behaviors that increase the probability that students will be personally and academically successful."

Listed below is the project timeline and the required academic and field experiences:

Summer

Special Methods Courses in the Content Disciplines

Mid-August

On-Campus Course Work and Off-Campus Retreat (Team Building and Instructional Theory)

Late August through September

Introduction to school, including shadowing students, meeting and participating in teacher in-service with cooperating teacher

September

On-campus coursework in instructional methods and curriculum planning combined with one day a week in school with cooperating teacher

Early October

Ten-day rural teaching field experience for all students and faculty, living and working in a rural community

Mid-October Through Mid-December

Full-time field experience teaching for eight weeks, junior or middle school level, supported by meeting once a week

January

Baseline Training, high school colloquium, reading and study skills class during three weeks in January support the high school field teaching experience which continues then to April

Early April

Job Search preparation and job fair

Mid-April

Multicultural training and field experience

April through May

Coursework on campus covering educational philosophy, application in teaching and leading change, evaluations

Some program participants then complete any traditional courses required in their concentration or coursework and writing required for the master's degree in Educational Leadership.

These experiences listed in the timeline are roughly divided into segments of one to two weeks with specific content focuses. When engaged in field experiences, students are primarily off campus in the cooperating schools, spread across seven school districts. Before the official school-based portion of the program starts in September, there is a team and trust building experience, much like an Outward Bound outdoor experience. The program brings in specialists in youth problems and teachers for a unique "baseline training conference" dealing with exceptional problems, such as drug abuse. Overall the uniqueness of the program suits its adult participants who reported to me that, "this group can't sit still for the traditional classes. If we went to the other classes, we would appreciate this [Project Promise] more."

Both the field-based and academic learning experiences required by Project Promise of all participants are competency based. The project directors have delineated nine competency areas, identifying specific expectations under each. The nine areas are:

- Students
- Teaching tools/instructional practices
- Effective use of elements of instruction
- Questioning techniques
- Response to questions
- Motivation
- Classroom management
- Environment
- Planning
- Assessments
- Relationships with teachers, other staff and with parents

For each competency area, there are six to 10 expectations for performance. For example, for the area "Students", the project specifies that the program participants must demonstrate clear understanding of developmental needs of students at the middle school/junior high or high school, must keep an action plan to address the concerns for students with "at-risk" behaviors, and must provide positive consequences for students. Under the competency area of "Environment", the specific expectations include: greets students at the door, (shows) evidence that you enjoy your students, (makes clear that) mutual respect is evident between students and teacher. The supervising teacher and the supervising faculty from Project Promise are thus letting the program participants know (1) their expectations for performance as a teacher, (2) their preparedness to measure these competencies which are expected to be demonstrated and (3) their willingness to provide feedback as appropriate to the student teachers.

Project Promise participants are involved in five student teaching placements which range in length from one week to 10 weeks and from half to full days. The two traditional student teaching experiences are eight weeks and then 10 weeks in length. The first, in a middle or junior high (an alternative school is one of the sites available) is done by students in pairs. Project Promise co-directors report that the reshaping of the field experiences has been significant over the first three years of the program In the first year, students spent three weeks divided between half day observations and half day classes. The faculty and staff realized that to get a sense of the whole life

of teachers, students needed to be in the classroom with cooperating teachers all day. At the same time, there was a realization that to ask them to be teaching this early in the program would be a burden not only for the students who were not ready to assume full teaching responsibilities, but also for the cooperating teachers. A decision was made to front load the theory and intersperse the internship experiences with special workshops and educational studies.

After the first year, the staff also realized it was important to get students into the school at the beginning, to see how the school "wakes up." Armed with "look for" sheets, the Project Promise students observe for the first week of the school year, with specific assignments including to note what is happening the first day and to shadow a student for one day. The project participants come back on campus to discuss what they have learned.

Cooperating teachers are cultivated and incorporated into the Project Promise experience. A comprehensive guidelines memo describing their role has been developed by the project staff. This covers when students will be in the classroom, the background of the students, and the teaching/mentoring relationship which is the goal of the cooperating experience. Cooperating teachers meet the cohort group at the beginning of the school year, presenting their experience in working with adolescents and addressing many of the nine competency areas required of all program participants.

Project Promise participants are encouraged to do team teaching within the first two weeks of the long winter internship (end of January through the end of March). Cooperating teachers are reminded that this is the third field and internship experience the participants have had in schools, including a rural living and teaching experience. In the guidelines memo, cooperating teachers are also directed as to the number and nature of formal assessments for their student teachers. To help collect standard assessments on all student teaching experiences, Project Promise staff make available to cooperating teachers daily feedback forms which are observation reports addressing competencies in planning, instructional technique, management and motivation, and professional behavior, and final evaluation forms which follow these competency categories. In addition, supervision of student teaching activities is facilitated by the use of a feedback form which lists the nine competency areas presented above.

There are no grades provided to students upon completion of the program components. Performance in the Project Promise classroom and in the public school classroom is the test, along with feedback from students, from fellow participants and from cooperating teachers. Supervision reports are completed weekly, but are supplemented with almost daily feedback from the Project Promise faculty supervisors.

A portfolio is developed by each student and contains a complete description of their experience in the Project Promise program. Using a standard binder, students show their individuality and creativity by the way they organize the portfolio and its contents, for example, incorporating early and more recent lesson plans, evaluations from their own students during in-school internships, evaluations from the cooperating teachers and Project Promise supervisors, photos from group recreation and trust-building experiences, teaching experiences, descriptions of feelings as one might track in a personal journal, and various writings are all likely to be part of the portfolio. The opportunity to view a couple of portfolios and lesson plans included in them gives one a sense of the detailed work expected of the students, as they are learning to integrate knowledge about teaching with knowledge about the subject matter they plan to teach. One student, teaching a lesson about the weather, was not only seeking to transmit the concepts, she was also responsible for supporting her students as they learned to write about science in their own words. Having this

information in the portfolio was helpful to the student, who could look back and note how her development as a professional was taking shape. The quality and inclusiveness of the portfolios recommend them as a useful tool to the faculty and cooperating teacher as well.

With some advance knowledge of important off-campus and on-campus experiences provided by co-director, Sharon Carson, I chose to drop into the setting during early April. The cohort had recently completed its rural living experience. The job placement workshop was completed and the group was getting ready for a week-long study of diversity and education. While a description of the mission, goals and curriculum components does accomplish the job of distinguishing the program from other traditional and even nontraditional teacher preparation programs, it is not sufficient to explain the essence of the program--the what of it. I was prepared to observe the in-class sessions and the cohort group knew I would be there. However, what happened was that I became a *member* of the cohort and participated for two and a half days in all in-class activities. Outside of class I spoke with the faculty, the co-directors, visited two schools where students teach, and had a soft drink with a group of cooperating teachers at a local grill.

The cohort group of students was settling back in to their home base after their week-long rural experience in Wiggins, Colorado. When on campus, the group meets together in a classroom in the basement suite of the education building. On seminar days, morning coffee and donuts are provided by the students for each other. Seating arrangements around the small tables are based on when they arrive and with whom they wish to chat. This was to be the start of a two-week seminar Diversity: A Celebration of Difference. To kick off the study, which would encompass classroom presentations, film and debriefings, student visitors and simulations in the first week, a CSU professor Dr. F.C. Luna, whose field is educational leadership and administration, came to do a workshop on multicultural issues. During the second week, students were to participate in on-site experiences in multicultural settings.

The 17 people who comprised the third year cohort were there: nine men and eight women. These were adult students with a fair amount of professional experience in a variety of work settings. Represented were a veterinarian, a lawyer, a restaurant manager, a businessman, a training manager for a computer company, a postal worker, and a full-time mother. Their goals for teaching areas and levels were equally diverse: secondary social science, language arts, biology, and journalism, as were their desired settings--from traditional high school and middle school to alternative school environments.

Before Dr. Luna began, the students were told by a faculty member that the goal of that week was to develop one intercultural competence skill: "I believe you need competence skills that are intercultural, not culturally specific." An agenda covering the week was handed out and the following educational objectives were listed for the week: (1) to increase awareness of other cultures in our current pluralistic society; (2) to be able to design classroom materials that will incorporate both the awareness of individual differences and the utilization of communication skills for positive interpersonal interactions; and (3) to be able to explain the concept of diversity and reasons for its ongoing incorporation into the total daily classroom experience.

To start the discussion, a brainstorming session required students to list the different subgroups in the United States which could be formed along lines of interests, politics and religious belief and to describe themselves by the combination most appropriate to their experience. The students were told that behavior is a function of belief structures and that with knowledge about these and how energy travels along these structures to result in behavior, they would be equipped to work with difficult student problems.

Dr. Luna developed a map of key points in the process of developing intercultural competence which he calls "The Awareness Stretch." The Awareness Stretch is a step-wise diagram depicting the stages through which an individual develops a greater and greater acceptance and acknowledgement of difference, until they reach a level of intercultural competence. The stages are: nonaware where there could also be denial of difference, notice or awareness, acceptance of difference, understanding, adapting, and competency achievement. At the awareness stage, the dissonance that occurs can push the individual back down to the denial stage through what Luna called the "denial curve." Heading in this backwards or "wrong" direction could lead to passive, active, or even violent behavior which expresses this denial.

His presentation showed how an individual progresses through such a map, as information, energy, and intervention work together to move this individual to a level of understanding and then beyond. While the students were interacting with this information as individuals, challenging their own belief structures, the point kept being made, by the faculty and the presenter, that this would be part of the day-to-day knowledge they would need to be sensitive teachers, alert to the needs of their students. As Dr. Luna says, "Teachers can create an environment in which kids can make a shift in their belief structures." It is through this kind of structured group learning that Project Promise tries to bring theory and practice of teaching close together with the experience of the individual.

As the students considered his message, Dr. Luna advised them that, "Good teachers are up at the top steps, they appreciate student differences, they take risks with their energy, time and resources to create experiences for students to deal with different belief structures."

By this early point in my observation, it was already clear that one of the remarkable aspects of the cohort program is the expectation that all students will experience the development of the capacity and skill of giving each other constructive feedback. This skill, which one thinks of as necessary to supervisors, is--it is believed here--also required of good teachers. Therefore, the co-director, Sharon Carson has built in the opportunity to experience and develop this skill during each and every day in the program. To the participants, this time of feedback is known as "processing."

In the first day of this multicultural week, after the presentation by Dr. Luna, two hours were set aside for debriefing and processing of the previous week's activities and the awareness model just presented. In the afternoon the assembled students watched a film entitled, Black and White in America from the B'nai B'rith organization which is the first piece of a B'nai B'rith multicultural curriculum called "A World of Difference." This film included strong scenes of discrimination integrated with interviews of famous and "real people" on the themes of difference and discrimination.

One of the faculty assistants for the project, whose expertise is in human development, human relations and supervision, prepared the students for a discussion of the film by asking them to share their sense of the appropriate rules for such a discussion of differences. This discussion was preceded by the recognition that individuals hold stereotypes of cultural differences, even about their own cultural groups.

Students responded by listing the rules to which they expected each other to adhere in the discussion about the film: honesty, risk-taking, respect for ideas that are different, supportiveness, some thoughtful time to reflect, respect confidentiality if needed, and good judgment. They then took time to list not only incidents in the film that were striking, but also the feelings these incidents engendered in them and the ramifications of the incidents for the lives of the people depicted in the film and, more generally, the lives of all people. For example, to a scene showing children's negative views of the terms black and white, the students expressed profound sadness and anger and

commented that they could understand how children growing up with these negative stereotypes would feel they are not worthy of respect. The whole movie, said the project participants, made them feel guilty about contributing to the dominant culture. They commented that among the implications the movie would have for their own lives would be a renewed determination to take responsibility for their own actions.

Making a dramatic change of tone and topic, as it was the first day of this on-campus week, the Project Promise students spent some time with the co-directors talking about the previous week's activities, a job search class and fair with representatives from various school districts. The students gave different accounts of meeting with district representatives, some positive and some negative. Overall they said the role playing done for them by Project Promise staff and with them was great practice, helping them make good choices in selecting the interviewers and in providing answers to interview questions.

The program directors then gave feedback to the students from the interviewers, who evaluated them as the highest caliber group among all three cohorts of Project Promise participants so far. Two questions were highlighted as examples of interview traps: "what would your perfect school room look like" and "if you had millions of dollars, what would you do as a teacher?" It was the opinion and experience of the co-directors that the interviewers were looking for prospective teachers who really want to teach and could give specifics about how they would do so, arranging their learning environment and affecting policies, practices, and resources if they had control.

The interviewers from the school districts suggested that students needed to develop more of a belief system about managing the behavior of children. The interviewers also provided feedback on the kind of answers they are seeking from prospective teacher candidates. For example, on the topic of "your perfect room," the interviewers said they were looking for a specific room description as well as specifics about creating the teaching and learning environment. Project Promise students were told that openings for teachers were likely to be at the middle school level. Unfortunately, even though the students made a good impression, this came at a time when some districts were responding to recent decisions about funding public education by the state legislature by firing some teachers. The mood should have been more positive, because of the job fair experience, than it was, because of this recent news.

The Project Promise faculty discussed additional areas of interest to the interviewers, specifically, interaction with parents about student problems. They asked students to tell them how they would relate to the parents of an Hispanic student, for example, where and when would they schedule the parent interview. Finally, they recommended following up the interviews with brief thank you notes.

The week-long multicultural training continued with two significant components: presentations by the students themselves. Students of diverse backgrounds from among the Project Promise participants were asked to share their experiences and insights regarding living and teaching in a multicultural world. In addition undergraduate students who were part of the university's diversity task force (Dr. Carson had worked with them in this context.) and those who came from the CSU Counseling Center talked about the different kinds of cultural expressions to be found on the campus and the extent to which students would find support for their differences. It was emphasized that training for faculty and students at CSU is available through the work of the diversity task force and counseling also is available through the counseling center. For their presentation to Project Promise, the speakers concentrated on symbolic differences--expressed through habits of dress and adornment, as in ear and nose rings--and expressed differences,

expressed through sexual preference and racial group association. The presentations were relaxed and yet powerful and were well received with positive feedback from the Project Promise cohort.

On the second day of my visit, the group participated in the game Bafa-Ba-Fa to experience the problems of understanding the characteristics of different cultures. This "training experience" is a commercially published development resource used in many contexts, in-school and in the workplace. To make it work, the class was divided into two subgroups and each group was given a "culture;" that is, a set of characteristics and symbols that would make them distinctive. Then each group sent a "cultural spy" to the other to observe and learn the culture and report back to their own group. The most important lesson which participants took from this game, in their own words, was "the appreciation of how difficult it was to try to fit into another cultural group when that group does not communicate its ways of being and doing to you and you must try to figure it out by yourself." "You are successful if you get the most important values; if not, you are a hopeless failure at fitting in." Besides being a lot of fun, playing Bafa-Ba-Fa gave everyone a chance to interact on a different level, within the equal playing field of a different culture.

The rest of the two full days visit to Project Promise was spent in visiting school sites and talking with faculty and with cooperating teachers. They all supported the approach of the project and the intensive involvement of the co-directors with the school personnel.

As I left the project after two and a half days, students were still discussing what their multicultural identities meant to them as individuals and as prospective teachers. They stopped long enough to "process me" with some compliments about my participation and willingness to be an observer in their group. In return, I thanked them for accepting me and tried to do a funny comparison of their culture in Fort Collins in Project Promise with the one I was heading back to, Washington, D.C.

Washington	Project Promise in Fort Collins
• Policy by those in power	• Rules are established by the consensus of the group
• Individuals are unequal	• Sensitive to equality issues, kid about it, but work towards it
• Money is the currency	• Knowledge and feelings are the currency
• Values are set according to public relations needs	• Respect, and honesty are valued
• Language is all about impact	• Language reflects concern for risk-taking, "self-talk"
• Interests are politics	• Interests are growth and student learning
• Food is fancy, like pasta	• Food is simple and cheap, spaghetti for $1.50
• Meetings are more prevalent	• Work is more prevalent
• Future outlook: we need all the help we can get	• Future outlook: very good for the culture

Recruitment and Selection

Project Promise solicits applicants through advertisements in area newspapers, distribution of pamphlets and brochures, contact with personnel managers of local business and industry and contact with other campus departments who refer graduate students to the project. In addition, applicants hear about the project from alumni or school personnel who work with the project. While the recruitment effort casts its net broadly, the admissions process is rigorous, because the number of spaces each year is so limited. The efforts are quite successful. In 1989-90, 100 applicants were gleaned from 264 inquiries. In 1990-91 there were 400 inquiries about the program. In 1991-92, 80 applied. In each year about 20 students were accepted. Program applicants sometimes wander into the project office by chance, for example, after going to the dean's office to request information about alternative certification. Reflecting the general public's confusion about state-approved alternatives to traditional certification programs, adults considering this route look to the higher education institution to help achieve alternative or emergency certification for teaching. In the states where such efforts are college and university-based, there are full academic programs, like Project Promise, available to interested parties. Inquiries come from individuals in all sectors (nonprofit and commercial).

As a coincidence (and as if to prove this) while I was staying at a local inn and eating breakfast, a Peace Corps recruiter also staying at the inn inquired about the teacher certification process of me, since I was there to visit the program. I suggested she stop in and meet with Dr. Richburg to learn about it, which she then proceeded to do. This somewhat serendipitous

recruitment process was confirmed by a conversation with a current participant. She reported coming to the department for information about certification and applying. The timing of her application and the qualifications of the current group of applicants resulted in her placement on a waiting list. When notification came of the opportunity for acceptance, the applicant had to make a decision virtually overnight.

The process of screening applicants goes beyond the university's set of requirements for entry into the traditional undergraduate program. It involves an interview, structured by a questionnaire. The questions cover a description of the applicant's interests, current occupation and reason for leaving, reasons for application, views of school, beliefs about ways to teach, and beliefs about the characteristics of teachers. The program has adopted the Selection Research Inc. Teacher Perceiver Instrument (SRI) as a basis for predicting the success of the applicants and incorporated this into the selection process. From this SRI instrument, the project directors took the dimensions of teacher/perceiver: mission, empathy, investment, input (drive), innovation and constructed their own set of tools and the Candidate Interview Matrix. The Matrix translates the dimensions of the teacher to the following categories: degrees earned, career experience, estimate of mission, teaching experience, voluntary service history, and empathy.

Each candidate also takes the Meyers Brigs Test, and participates in a creativity "in-basket" activity with a task and materials that can be assembled or applied to the task in any number of ways. An additional pencil/paper ranking exercise called "Tonight's Agenda," is also part of the selection process. This sets before each applicant a list of typical work and personal demands that a teacher faces once he/she leaves school for the day and asks them to rank these in the order in which they would receive attention. Prospective candidates must also meet the undergraduate curriculum requirements, GPA and California Achievement Test scores.

The Participants

The survey designed for all mid-career teacher preparation program participants was sent twice to the current participants and graduates of the Project Promise program. Eighteen of the 80 participants surveyed responded. Their average age was 37 and two-thirds were male. Reflecting the limited participation of racial and ethnic minority groups in most teacher education programs, the Project Promise respondents were primarily white--94.4 percent. Half were married. One-third were single and about 17 percent were divorced. One-third of the respondents reported having children in their families.

Eleven percent of the participants reported their highest degree was a first-professional degree and 22 percent had a master's degree. Thirty percent of the participants had previous work experience at the management level. The average salary before entering the program was $30,027. This reflects the participants' younger ages and shorter work histories, compared with some of the prospective teachers in the other mid-career programs.

Nine of the Project Promise graduates currently teaching full time responded to this survey. Their average salary was $22,983, which was lower than their previous earnings by $5,961. Primarily certified in the fields of social science and hard sciences, 22 percent of these new teachers had been military officers and one-third to one-half reported previous teaching experience, such as teaching at the college level, coaching, and training others as part of the job.

With experience in the military and in management positions, the new teacher graduates thought their experience, sense of duty and enjoyment of kids were their greatest potential

contributions to teaching. They reported that teaching was chosen as a second career for its internal rewards and for the joy of working with kids. Graduates of Project Promise indicated the program experience had changed their views of public schools. Most reported being neutral or positive about school characteristics such as management, community involvement, discipline, and the availability of resources. These are aspects which often frustrate new teachers, according to the directors of the programs we observed for this study.

Newly practicing teachers were also inclined to be positive or neutral about the conditions of teaching, but were slightly less so about salary and class size. As an indication of the need for versatility in the teaching candidate, the participants currently teaching reported being assigned to more than one subject: 44 percent reported teaching sciences; 22 percent mathematics, almost 56 percent social studies, and 33 percent English/reading.

Project Promise as a teacher preparation curriculum seemed to provide the new teachers with most of what they needed, in terms of content and pedagogical preparation, to get started. While they were concerned with the lack of time for organization and preparation, they felt successful in helping kids learn and in creating interest in the content. They reported being very positive about their interaction with students and with teachers in their department. For most challenges of teaching--content, methods, special needs of students--Project Promise teachers reported feeling prepared. They cited the strengths of the program that prepared them as the meaningfulness of its content and the quality of its instructors. In written comments to this special survey, Project Promise graduates complimented the staff on their caring, inspiring and professional treatment as well as the immediate exposure to the classroom environment and fast track to certification. Weaknesses of the program were said to be located in its organization and the inflexibility of program requirements. A certain amount of confusion and lack of time to learn everything because of program structure were cited as weaknesses. Also, a need for clerical support staff was mentioned and assistance in obtaining financial aid. Those who participated in the pilot year of the program pointed to disorganization and lack of follow-through as well as lack of assistance in job placement as weaknesses.

The Project Promise survey respondents recommended that their program look at content emphasis, especially in the areas of classroom management and student special needs. Financial assistance to get through the very "tough year" was on the minds of both survey respondents and the participants I interviewed on site. Finally, respondents recommended looking at the quality of some of the faculty and the communication between the project staff and the education department in terms of expectations and requirements.

I was fortunate to be able to talk with four alumni and hear about their experience, memories and satisfaction with Project Promise and their frustrations with working as a teacher. All were pleased they had chosen this route to teaching and were happy to be in schools working with kids. One alumnus, now a language arts and drama teacher, had tried traditional teacher preparation programs without finding satisfaction. Her inquiry and application to join Project Promise took place with almost overnight speed, while she was preparing to be a foster mother. When offered the opportunity, she was able to take it because of her proximity to the institution. When the program was completed, she took a local job, although she had an offer from a rural community, because her personal circumstances prohibited a move. Asked to comment on the strengths and weaknesses of the program, she offered that "the method was the message" but that the program needed to work on its advisement of individual students. As a new teacher, this graduate reported some frustrations with the job. Once in the school in her new position, she found she had to rely on her own knowledge of the theater and resources to help students because the school had few to help her. She pointed out

another often mentioned concern of teachers and the public alike, that there is little evaluation of the teaching staff by the principals.

The other alumni talked about how well prepared they felt they were to teach, to take risks with the content and methods, and to feel comfortable with the culture of school. At the same time, they reported still being shocked by the enormity of kids' problems and the values they carry with them "from their parents." The Project Promise Baseline Training, a three-day experience with an outside trainer, was cited for helping students understand drug and substance abuse problems of students likely to be part of the teaching experience. Alumni noted though "the real world is a little more coarse" than the role-playing they did in their Project Promise classrooms and as teachers they find they must hold back a little because they are unable to solve every problem or intervene in every family. In the Project Promise Baseline Training, by contrast, they were able to "give it our all."

Finally, the alumni pointed out the nurturance of Project Promise and its philosophy which they found to be "so intact." Comparing themselves to students trained in undergraduate traditional teacher education programs they were now meeting in the schools as peers, they felt able to handle the pressure. These alumni felt they had a support structure in Project Promise staff and alumni, they had developed skills of working within the school faculty from their internships, and they felt comfortable going to their school colleagues for help. In their opinion, student graduates from traditional programs had neither this support nor "know-how."

The chief suggestion for improvement of Project Promise seemed to come from a maturity and wisdom of experience of these new teachers. More reality testing and stress management should be incorporated. "The Project Promise success philosophy was great, yet in the real world we don't always succeed," they said. "Even if we believe that all kids can succeed, we realize as teachers that they won't." Alumni disagreed slightly over what to do. Some said teachers must bend over backwards to help kids pass and others claimed this could not be done in schools, considering a realistic assessment of problems and deficiencies.

Faculty

When I arrived to visit the project, there were five individuals dedicated to the project as instructors, managers, advisors and supervisors of student teaching whose total effort was translated into the equivalent of 1.6 full-time faculty members (Bob Richburg, and Sharon Carson are co-directors, Barbara Nelson is a CSU faculty member, and Ed Scott is a graduate assistant/faculty associate.) The faculty are considered interchangeable by the students in terms of program advising, however, there are some areas of expertise represented among the faculty. Dr. Richburg, for example, is one of the CSU faculty who are responsible for the professional methods courses. Dr. Carson coordinates student teaching experiences and supervises, interacting with the cooperating teachers. The processing and feedback experiences for the cohort are led by all the faculty at some time during the courses and experiential activities. Once the master's program is implemented, the faculty will have additional academic responsibilities. Besides participating in traditional graduate courses in leadership which will be required for the master's degree, another new student requirement will be the writing of a master's paper. This requirement is substantially different from any Project Promise assessment activities, which are based in the authentic setting of the school. The philosophy and approach of the Project Promise curriculum requires an intense amount of faculty interaction with students, but the university can provide only a small share of its faculty resources to maintain this effort. The faculty/student ratio and faculty productivity--a small number of students going

through the program in any one year--has been raised by faculty in department and school discussions. Teacher education is typically a highly productive unit, therefore the idea of focusing a lot of resources on a small number of students is likely to be of concern to most teacher education units contemplating the institutionalization of alternative programs.

The Project Promise faculty are supported by content area specialists in the school of education who teach the professional education methods courses in the disciplines--science, foreign language, language arts. As we have seen in the study of diversity, special speakers from other divisions of the university are invited to participate. Project Promise believes in the expertise of its cooperating teachers and invites them to be part of the program from the beginning of the experience, to teach during the baseline training and other sessions. This participation is an extension of the belief of those who advocate Professional School development as a benefit for both in-school personnel and those in training. The cooperating teachers are not paid but they receive release time from their schools to take part in these academic and experiential sessions.

Future plans include setting up a professional development school to offer both pre and in-service training.

Program Costs

Project Promise is located at a public university and in-state students pay about $3,000 for the year's tuition and fees. About a third of the participants have some student aid assistance. I found through casual conversations with some current participants, though, that few know how to work the system at the university to get information about aid for a special certification program such as this one. Having some experience with aid programs and student aid offices helps. For example, one applicant told of the various jobs in and around universities she had held before deciding to enter the program as a full-time student. She said her experience helping other "high need" students with aid options served her well. She was able to get some help and fulfill her goal of being prepared for a teaching job.

Lessons Learned

There are some specific areas where the innovation of Project Promise holds lessons for both traditional and nontraditional teacher preparation programs. A survey of the teacher policy literature and an exploration of the directories of policies and programs, leads one to the sense that most undergraduate programs are constrained by meeting state and/or accreditation standards as to course offerings, course order, and field experience requirements. One wonders how it is possible to arrange either content or instruction in a different way to meet the needs of adult students and at the same time fulfill the requirements which guarantee successful completers a license for teaching in that state. The lessons of Project Promise demonstrate that it is possible to create these variations and graduate students who feel prepared to address the challenges of the classroom.

The organization of students in one cohort which is carried through the entire program with a set of faculty and administrators is one way this variation is accomplished. While the benefits seem obvious--standardized content, periodic group assessment, mutual learning support and development--the drawbacks are also well articulated by the program participants. For example, some report they feel forced to be friends with the members of the cohort. Others have decried the rigid structure of the program and the lack of opportunity to select courses and experiences of

interest outside the program's outline. On the other hand, the structure is approved and thus the program is able to move individuals along at the same, quick pace and help them reach their certification goal with minimum waste of time and money.

Without the rigid structure and schedule of the program's seminars, methods courses, and workshops, it would not be possible for the directors to schedule innovative field experiences. In the rural experience, the entire cohort travels together to a small town where they live with families and work in the schools in as many different roles as one might imagine. Going through this together and being located in the same school is a departure from the other experiences, when students work as teams and then as individuals with cooperating teachers in a variety of schools and school districts--alternative, middle, secondary. The cohort shares an assimilation experience that then should be a powerful reminder of the challenges of understanding and getting along with another culture when the group addresses the questions of diversity.

The structured curriculum and field experience schedule facilitates an alternative assessment process that is creative and authentic. Feedback to improve performance is the core of the assessment philosophy. There are more qualitative efforts implemented for this which require the students to be the guides of their own assessment. This is made possible by the development goals of the co-directors and the willingness of the students to engage in portfolio development and peer feedback or processing experiences.

Project Promise has learned to use its student and faculty feedback to improve the content and the structure of the experience. Changes in observations in the schools (more and early), cooperative arrangements with the mentor/master teachers, opening the master's degree option for the cohort are just some of the changes that have taken place in the first three years of the program's life. Effort is being made to improve the content of methods courses, identify student gaps in knowledge, increase involvement of school professionals, and offer more follow-up support to graduates. If the project continues, these student requirements will need to be addressed for the comfort and competence of the graduates.

Update

From 1989 to 1992, the Project Promise program sought to provide participants with a fast track for certification at the secondary level. In the 1992-93 academic year, the program was authorized to provide a master's degree in educational leadership as well, for those participants who wish to complete the additional required courses. This expanded degree status changed the start date and the rhythm, as all participants now start the program in the summer to take the nine hours of methods courses required for the study of the discipline in which they are seeking certification. This change permits the program to continue its nontraditional curriculum delivery and numerous field experiences during the school system's academic year. At the end of the spring semester, from May until August, any additional course work for teaching concentrations is completed and those who wish to complete a master's degree continue their requirements at that time.

Engineers Into Education Program
Digital Equipment Corporation

Digital Equipment Corporation is one of the largest employers in Massachusetts and a multi-billion dollar corporation. Its headquarters are in a small town in Massachusetts, but its offices and manufacturing facilities are located throughout the state, in other New England states, and worldwide. It has been the subject of numerous articles and books, principally because of the philosophy of its founder, which was expressed throughout the corporation in the way professionals worked together, collaboratively in teams based on projects and problems.

Throughout Digital's 35-year history, the company has had strong community relations programs including a number of partnerships with K-12 schools to contribute to the quality of education in the communities in which its employees, often highly sophisticated engineers and computer scientists live. An advisory committee of company executives and school personnel monitored its sponsorship of programs. Some of the partnerships were financial and others were of a technical assistance nature.

One of Digital's programs related to education is their Engineers Into Education (EEP) initiative, a program that supports engineers and other technically-trained Digital employees to leave the company and enter an education profession. The program offers both information and financial support to employees considering such a change. Special seminars are held for invited employees and the financial "Bridge" package, including stipends and tuition dollars, is offered to separated employees.

Unlike the four previous case studies, this program is not university-based and has no "curriculum" component per se. The Engineers Into Education program should be seen solely as a transitional package, offering information and financial support. We heard about this effort at Digital from representatives who were working with AASCU at the time in the area of hardware and software. Since the goal of the program was to help eligible Digital employees make a transition to new careers in education, and because it was one of the few in the country where industry was directly involved in supporting a transition of scientific personnel into education, we sought both a partnership in our study of alternative teacher training programs and a chance to visit and write about the program.

Setting

There were multiple settings for the transition program activities, none of which were located at any of the company's offices. Instead, the participants from out of state (as far away as Washington State) stayed at a modest hotel in Chelmsford, Massachusetts, a suburban community about 40 minutes from Boston. Meetings were held in the hotel's ample and attractive meeting facilities and at the Chelmsford High School, where both Digital and one of its private partners, the Merrimack Education Center (MEC), had formed partnerships with the math and science departments. In addition, the area from Chelmsford to Lowell to Boston was a laboratory for the participants, who were engaged in numerous site visits to elementary schools, magnet and private schools, secondary schools, vocational/technical schools, community and state colleges.

Program Objectives

The objectives of the Digital Engineers Into Education Program represented the best of both worlds, education and industry, in their concern for bringing qualified individuals into the teaching profession. Managed by a former superintendent of schools who had extensive connections to

schools and school personnel, the program sought to cover all the information about education policy, reform, structure and the process of becoming certified as a teacher that would be needed by someone making such an important career decision.

While the original impetus for the program may have been to alleviate an identified shortage of qualified mathematics, physics, chemistry, computer science, and engineering teachers, in its second year it became a company human resource strategy to assist qualified and dedicated individuals to leave as part of the company's downsizing efforts. As the company's executives changed, the program's existence grew more tenuous, and the objectives of both the participants and the company professionals staffing the program shifted. It was not easy to determine where the responsibility for the Engineers Into Education Program lay and what its connections were to the structural changes within the company. Teaching in secondary schools was no longer the objective shared by most of the participants, instead, the goal was to leave the company and to enter fields where their scientific and technological backgrounds could be of assistance, including education. More participants were interested in higher education teaching. Some felt hurried out but still were pleased with the vehicle offered in this transition program. Meanwhile, the MEC staff took on increased responsibility for the transition program as the Digital staff left the company or were assigned other responsibilities. Some of the comments gathered in seminar evaluations over the three years of the program reflect the turbulence and variety of feelings about the transition program.

From a survey of the 1990 participants: "The program was exceptionally well run--the best I ever saw at DEC." But also, one participant said, "It was never clear to me what DEC's intent was in setting up the EEP." Another transition commented, "The co-incidence of EEP with the start of 'transition' sure looks like it's a glorified form of transition."

The same group of participants had different views of their prospects for teaching. One looked at his prospects dimly, "Until the depression ends in Massachusetts, I may not find a job." While another had found a way to make a start and was determined to go ahead, "[I] taught 4th-12th grades computer science at two Catholic schools as a substitute teacher for about two and a half months; the experience turned me on."

Some of the engineers who left at this time changed their minds about pursuing an education career as a result of personal and financial set backs or negative school experiences and wished to return either to Digital or to another job in the scientific community. The results of this early research were important to the staff of the program, who tried to improve the selection process to enable them to meet their objectives by attracting those who wanted to leave the company but also whose interest lay in teaching.

Beginnings

In the late 1980s, several programs focused on bringing mid-career professionals into the classroom were in place and making headlines in the New England area. In Massachusetts, Harvard had begun one of the first alternative route programs for teacher training at the master's level in the early 1980s, the Mid-Career Math and Science program. The Polaroid Corporation had established a successful exchange program with schools whereby teachers were brought in to work with the corporation's scientists for six months to a year. Also, the AT&T "Transition into Teaching" program was created by the AT&T Foundation in 1989. This program was offered to recent retirees and then extended to anyone at risk of being separated due to company downsizing. The AT&T

benefits package included up to $3,000 for expenses the employees were expected to incur in the process of entering alternative route teacher education programs.

Using these examples of programs to transition employees out of a company and into education, Digital decided to create a program of its own, Engineers Into Education. In 1990, the vice president of research at Digital appointed Burton Goodrich to implement and manage a program to help computer engineers and scientists transfer their expertise to teaching. Digital supported the complete cost of the program, setting up a group of staff to handle the recruitment, advisement, program implementation and assessment. Digital asked the Merrimack Education Center, a non-profit educational consulting and training firm, to develop the materials and the organization of the seminar it proposed to deliver, Explore Education. MEC was founded in 1967 and serves the needs of school districts in north central Massachusetts and southern New Hampshire. Its services include curriculum assessment and development, computer network design and implementation, and professional development design and delivery to education professionals. MEC has successfully won grants from both federal and state governments in cooperation with partner school districts in the areas of technology and gifted and talented education, among others.

Evaluations of the Engineers Into Education program were conducted by a Digital employee who was completing his dissertation research, and by MEC, for each of the seminars. We were able to read some of the resulting reports for this study. However, we did not interview the Digital executives who were responsible for making the decisions about the life of the program, therefore we cannot speak to their views on its success. This program was not a teacher education program, but an information and transition program, therefore, our approach to learning about it differed from that used in the other case studies. Similarly, we will try to fit our categories of characteristics around what we know about the program, but it will become apparent that they do not fit neatly because of its distinctiveness.

Program Curriculum

The Engineers Into Education program consisted of two phases. Phase I was an informational period in which employees learned about career possibilities in education via seminars and school visits. Originally scheduled to take two weeks with two intervening weeks for reflection and school site visits, these seminars became compressed into one, one-week session. Regardless of the iteration in which they were participants, the seminar attendees then returned to their company locations, where many completed additional site visits to schools and explored the personal and professional issues associated with changing a career.

The two-week "Explore Education" seminar created by Digital and MEC was the informational seminar we visited three times. Each time we attended, we listened to presentations, heard participant and alumni discussions, and visited school sites. The sessions were scheduled during regular school hours and were held, for the most part, at Chelmsford High School. The power of being in a school with students shuffling around you during class changes and in the cafeteria was felt keenly by all participants. At the same time, there was a bit of distance maintained by setting aside a lounge area for the Digital program where donuts and coffee were available and where a telephone was in reach, as well as arranging special meeting rooms within the high school.

In a typical seminar week, teachers, school officials, students, and college deans presented and discussed a broad range of topics about careers in education, including: teacher certification, teacher contracts and salaries, mathematics and science curricula, instruction standards, higher

education teaching requirements, tenure laws, school environments, and employment opportunities. For example, the fall 1991 seminar brought together superintendents and a representative of a state certification agency to explain the requirements for certification. Accompanying material in the handbook explained these in detail and provided examples of states where these requirements were changing. A representative of the U.S. Department of Education, Office of Educational Research and Improvement gave the participants a global perspective on the national goals and their impact on the study of math and science. The participants from Digital were impressed by the speakers and their knowledge of the work setting. Many of these speakers returned for each seminar, giving them a stronger sense of the Digital audience and giving the content a stability which was necessary during the time of change within education and within Digital.

Representatives of the education community came to speak to participants in a personal, no-nonsense manner which made the environment feel like a unique career-counseling experience. The participants were provided with an enormous binder of information, articles, and details about the field of education, the hot issues, and the supply/demand question, all of which represented a tremendous amount of research and organization by the Engineers Into Education staff.

The EEP participants asked questions about job availability and inquired about the translation of their experience to the credentialing requirements and for entry into master's and doctoral programs. While the line-up of speakers was impressive, bringing superintendents and deans to these sessions emphasized the connections between Digital, MEC, and the education communities. Participants were most excited by a presentation by a teacher named Peter Kostek, an advocate of the new math standards. He challenged the scientists and mathematicians who believed their theoretical knowledge was outstanding, to think like math teachers and like math students. His exercises tested their assumptions about learning and teaching and they thoroughly enjoyed the experience of becoming aware of themselves in new ways as learners and prospective teachers.

The participants in these seminars were both overwhelmed and astonished by the amount of information needed to make a decision. Some had already explored the process of acquiring teaching credentials. Others were quite rightly concerned about employment prospects. In fall 1991, for example, within Chelmsford High School itself, were the seminar took place, many teachers had lost their jobs, as the state's financial woes and student demographics combined to create an increasingly severe economic downturn.

The following table shows the schedule for the two-week iteration of the "Explore Education" seminar.

Sample Phase I--Week 1

	Monday	Tuesday	Wednesday	Thursday	Friday
A M	Welcome and Introduction Digital Equipment Corporation Guided Tour of High School	School Setting and Employment Conditions Math/Science Curriculum and Instruction Theory, Practice, Restructuring	Credentialing Requirements Certification Requirements	School Visitations	Education Bridge Package
P M	Education 2000: A Global Perspective Math/Science -- Meet the Teachers Wrap-up	Math/Science Curriculum and Instruction (cont.) New Standards in Math Wrap-up	Teacher Preparation Programs Equity in Education: Keeping Students in the Science/Math Pipeline Wrap-up	Discussion of School Visitations Engineers Into Education Alumni Panel Wrap-up	Networking Program Review and Assessment Next Steps and Wrap-up

Sample Phase I--Week 2

	Monday	Tuesday	Wednesday	Thursday	Friday
A M	VETERAN'S DAY HOLIDAY	Sharing Experiences of Two-Week Interval Brief Review of Host School Activities Visitations to Classrooms and Other School Centers	School Visitations	School Visitations	Participation in Activities at Host School or School Visitations
P M		Visitations to Classrooms and Other School Centers Briefing on School Visitations and Review of Participation Activities at Host School Wrap-up	Discussion of School Visitations Briefing on Participation Activities at Host School Wrap-up	Discussion of School Visitations Briefing on Participation Activities at Host School Wrap-up	Discussion of Day's Activities and School Visitations Next Steps and Wrap-up

One of the most interesting components of the seminars we attended were the alumni presentations. In these, five to seven alumni gave a wide variety of reasons for leaving the company and told of their success since leaving. It's important to note that these were the graduates who had attained the objectives most closely matching those of the transition program itself. Even though the way was not smooth for all, they were shining examples of the program's achievement. There were other alumni, however, whose comments on surveys conducted for the seminar indicate they were not moving along on their plans and were making mid-course corrections. Still others reported being dissatisfied with the company's benefits package.

Most of the alumni we heard said they were concerned about layoffs and about the changes in the philosophy of the company and that was at the foundation of their consideration to leave Digital. Others said they were considering changing careers anyway. They had inspiring stories of wading through the state bureaucracy to get credit towards teaching credentials, being accepted into graduate programs, and being hired as adjuncts at community colleges. They were appreciative of the Bridge package and the benefits which allowed them to be covered for insurance needs and health needs. These alumni were optimistic about their opportunities in training and in teaching. They were complimentary about the seminars and school visitations but also spoke about the sympathetic environment of the seminar in which it was good to associate with others in the company who were feeling the same way. All said they would make the same decision again if they were faced with the choice.

A recent survey of all EEP participants supports the comments made by these few enthusiastic alumni. "The two-week session of Phase I was definitely a major influence in my decision. Initially I couldn't envision myself being comfortable in front of a classroom trying to teach and being successful at it. However, after experiencing, the program I was convinced I should take this risk at a career change." "I wish the parents of my students could have the opportunity to hear the same speakers to better understand teaching and school." "I still call on my experiences of visiting schools under EEP to help me compare the way schools are run and how they might be run differently. Chelmsford High was an excellent place to hold the training."

During the remainder of the 10 weeks of Phase I, program participants visited elementary, middle, and high schools, and two and four-year colleges and universities to speak with educators and gain a feel for the educational community. Each visit entailed meeting the principal of the school, having a tour, being able to choose some classrooms to observe and being offered the chance to participate in teaching activities, where appropriate. After each visit, the Digital "students" returned to their base and discussed their reactions.

The company supported a decision time of up to 10 weeks for those participating in Phase I to decide if they wanted to leave the company and enter Phase II. That is, there was a certain time established for Phase I participants to notify the company of their intentions. Deciding to enter Phase II meant an employee was giving up his or her Digital job and entering into the company-supported transition into education.

If a decision was made to continue into Phase II, the transition out phase, individuals were encouraged to develop and submit an academic plan which outlined where they planned to continue their education to prepare for a career in education. Not all participants were heading for K-12 teaching positions, however. Some created programs and paths for themselves that were more directly related to their technology backgrounds. Several entered a master's or doctoral program in order to work at the postsecondary level. Individual plans, once approved, were then supported by generous benefits. In the first year of the program these included severance pay equal to one year

of salary, health benefits, and the cost of completing the education plan (tuition and related costs) up to $13,000.

Recruitment and Selection

Information about EEP was distributed throughout the company through its famous e-mail network and individuals applied to participate. The location of the individual--that is, within research, hardware, customer assistance, or other divisions--did not affect the chance of being selected. Rather, good evaluations, five to seven years of experience, and a strong interest expressed in education were the criteria for selection. Once selected for the first phase, each individual received support to come to Chelmsford to participate in the "Explore Education" seminar which was the initiation into Phase I.

The Participants

The AASCU survey of participants in the case study programs yielded very few responses from the Digital participants--23 out of 200 mailed. There are a number of reasons why this might have been the result. First, the participants were widely dispersed once they left the company. Second, the staff at the Engineers Into Education program kept changing, making it difficult to survey and monitor the survey population from that vantage point. Third, the graduates had already participated in a number of assessments conducted by Digital and by MEC. Thus the incentive to respond to our query was not strong enough to yield representative information about the participants.

However, we were able to read three assessments made available from MEC and the EEP staff. This information on the program participants, their transition processes and their satisfaction or dissatisfaction with the program provided us with valuable information. According to the survey results, the program participants all have appropriate technical backgrounds. They all met the EEP criteria for selection, that is, they have at least a baccalaureate degree in engineering, mathematics, physics, chemistry, engineering, or computer science. In addition, half have master's or doctorate degrees in business or technical fields. All came to the EEP transition program with high evaluations from their managers, which was another criterion.

The participants' interests span a wide range: teaching mathematics or science at the elementary, middle, high school, and college levels, managing special technical programs, developing mathematics and science curricula, and expanding the use of computers in classroom teaching. Of the participants who ended up working in education, 9 percent were in elementary/middle school, 11 percent were in high school/vocational technical school, 59 percent chose to work in college or university environments, and 21 percent found work in education organizations and other related fields.

According to the latest summary of results from Digital, which surveyed all the EEP participants over the three years that it was funded, six sessions of the seminar were conducted for 240 participants and 187 total participants (78 percent) entered Phase II. The description of the total population of participants up to that point is as follows:

- 69 percent were male
- Ages range from 28 to 63 years with an average age of 42 years
- Years of Digital service range from 6.5 to 26.5 years with an average of 11.5 years

- Most of the participants were from the New England area and Colorado

The study found that the majority of the employees who participated in the exploration phase of Engineers Into Education did elect to leave Digital (Phase II) for new careers. A follow-up survey of all Phase II participants conducted in the spring of 1993 indicated that approximately two-thirds were working in education or attending school to (ostensibly) work in education. The common characteristics emerging from interviews and surveys with these employees showed that participants in this program tended to:

- Be predisposed to become educators
- Have been thinking for some time of making a career change into education
- Feel an inherent desire to teach
- Have relatives or friends who are teachers
- Be people oriented
- Be clear about their values
- Feel strongly about wanting to "give something back" to society
- Want to help shape the future of the country
- Feel a need to engage in "worthwhile activities"
- Welcome new challenges
- Love technical subject matter
- Want a change of pace and a new work environment
- Want to spend more time with their families.

Almost without exception all say that financial considerations are of primary concern and that the severance pay, tuition, extended health coverage, and Education Bridge Package was key to their being able to make the transition. Former Digital employees addressed this issue, stating that "I would almost certainly not have done this without the financial assistance from Digital. One year at Harvard plus living expenses is a lot of money. Starting a new career which pays less than Digital and having student loans would probably have kept me out of education." "I am not sure that I would have taken this step now if it had not been for EEP and the benefits which reduced the risks to my family." Many who investigated the program and decided not to apply, expressed their intention of making the transition to education as soon as they felt financially able to do so. Those who actually did leave the company appeared to have some measure of financial flexibility which enabled them to continue to pursue it. Some characteristics of this flexibility include little or no home mortgage, children who have completed their college education (or no children), older employees who are eligible for early retirement or younger employees who see less of a differential between current salary and salaries in education, and a working spouse who provides an acceptable level of income, benefits, and security.

Faculty

The program was managed by Dr. Burton Goodrich within Digital with the help of two staff members. Over the three years of the program, this staffing was decreased. The EEP seminars were conducted by staff at the Merrimack Education Center, all of whom had extensive experience in training and education.

Program Costs

During the three years that Digital conducted Engineers Into Education, the company was involved in major restructuring (downsizing). Participants in the program received the same general severance benefits that other terminated employees received. Two major differences from regular lay-off were that this program was voluntary and included substantial financial support (up to $13,000 over two years) for retraining to prepare for a career in education. However, the Engineers Into Education program was suspended in the fall of 1992 and eventually terminated. Thus like many other industry/education collaborations, it was viewed as a frill, its impact was small, so when the priorities of the company changed, the program was eliminated.

Lessons Learned

We visited the program three times as it was going through transitions, in the fall of 1991, the spring of 1992, and in the fall of 1992. The company was downsizing over the three-year period of this NSF study, and each successive cohort in the phased-in program was affected as the program length and benefits were altered, reflecting the company's circumstances. By fall, 1992, the original program staff at Digital were changing their responsibilities and the program manager left the company to return to education. Forty-five participants from 15 states were participants in the fall of 1992. This became the last session as the company postponed its support of both the seminar (Phase I) and the employee assistance which was to accompany the "transition out" part of the program (Phase II).

However, those who did make it through have been overwhelmingly enthusiastic about the results of the Explore Education Seminar. According to the program staff, participants who go through Phase II report back verbally and in writing, before and after they leave the company, just how important an ingredient the seminar has been for them in their decision-making process. There is a general consensus that there is no other way that they could have had so much exposure to so much of the education environment in so little time as they did through the seminar.

Quotes from some of the former employees can best portray some of the aspects of the program. Regarding the program as a whole, participants have stressed such positive aspects as the removal of the financial obstacles and the exposure to educational issues:

"My experience has been very positive to date...I believe the EEP experience within Digital prepared me to enter my training program with enthusiasm...which allowed me to approach my studies more rigorously in order to prepare to offer the best to future students. I also attribute my success to the financial aid package which allowed me to focus on my studies full-time and not worry about finances."

"The positive support I continually received from everyone in the EEP office helped me to keep going when I was questioning the decision to change careers. Having the financial support took away one of my worries and enabled me to concentrate on my studies."

The actual seminars held for the Digital employees have been applauded by most of the participants. A great variety of information about education at all levels was shared and issues regarding training for a career in education were introduced. Some participants were disappointed,

however, that the seminars did not present the in-depth reality of schools. One participant recommended " a one-week mandatory substitute teaching experience. It would allow participants to get a feel for what it is like (classroom management, etc.) and allow them to make a better decision about whether this is something they really want to do."

The change in careers did not necessarily come easy to these former Digital employees. Many participants noted that they were not prepared for the actual change and had trouble adjusting to school. A few of the participants who went on to college for further education stated that attending an institution that was geared toward nontraditional students was a great help to them:

"Making such a drastic life change at this late stage was a daunting experience. Every step was a source of self-doubt and fear of the unknown."

"I have mixed feelings about leaving Digital. Although I am enjoying the educational opportunity...I do miss the career that I had established at Digital and the work that I was comfortable in and one that provided [for] the needs of my family."

"My experience in leaving Digital was less painful than I feared it would be. I had some concerns about my identity after 17 years of thinking of myself as a job title and DEC employee--and I found it difficult to be a student--a person with no authority and little competence after so many years of functioning capably at DEC. Fortunately the university I attend is geared to and supportive of adult learners, and I am excited about finding new ways to contribute."

The contribution they saw themselves making also did not happen automatically. Many of these former Digital employees had trouble finding jobs in the tight education market, especially in the New England area. These employees also found out that years of experience in the corporate world are not necessarily helpful in obtaining a position in public education. Although the EEP seminar attempted to show job market conditions, it may not have sufficiently prepared some of these transitional employees for those conditions.

The market conditions are one issue which led many of the case study projects to engage in recruiting adults to second careers in teaching. The other was a concern for the quality of math and science teaching and the idea that scientific professionals could bring something unique to the school setting. However, doubts about their ability to translate science experience into teaching skills are expressed by the participants themselves and they perceive doubts held by the school personnel from whom they are hoping to gain acceptance:

"I have questions as to how practical it is for people to go from industry to education, mainly because of the nature of the education industry and all their requirements...I can see some of the reason why the educational system of the U.S. is so messed up."

"Quite frankly, transitioning into the education field (as someone not interested in teaching) has been most difficult. Most schools simply don't have the funds for someone like me, so they burden their faculty/existing staff. So there's lots of need out there--but not too many jobs."

"The attitude of the (school system) staff members I have talked to was in contrast to the attitude expressed by the administrators in our EEP seminar. The staff do not necessarily respect the work

experience we bring to the table and the union environment in most schools is a significant culture change for those of us who have 10 or more years with the DEC culture."

Most of the Digital employees who have transitioned out, however, express satisfaction with their decision. For many individuals then, the program was a success. For the schools and colleges they entered as teachers, the program served the goal of bring highly skilled workers into education. The overall impact of the program however, was small. It joins the ranks of a number of unusual models of collaboration between business and education which have been recognized in magazines and professional journals and adapted for the short term by other companies. The generation and testing of these models has made a contribution to the field of educational improvement. It is unfortunate that so few remain in existence:

"My overall opinion is that the program was perfect for me. I finished my work on my program and had a new job the same month...I love teaching and love my job."

"Being able to complete graduate work in my field and then teach has been a dream for many years."

"It was terrific for me that I was able to combine my software experience with my education degree to work on children's software."

"The students I have worked with this first year have convinced me that I have made the right decision...It has been great."

SECTION III

SUMMARY AND CONCLUSIONS

In this last section of our report we bring together the lessons learned from the different programs, organizing them by the same set of characteristics used throughout the case studies. This approach will support our goal of comparing the programs and adding any salient research findings to the practical knowledge they have generated.

The literature on alternative certification encompasses program descriptions, directories by state, studies of the characteristics of the program participants and their teaching experience. Many of the studies share conclusions regarding the participants and the structure of alternative route programs. We will address these and add the results of the survey of program participants conducted for this particular study.

Setting

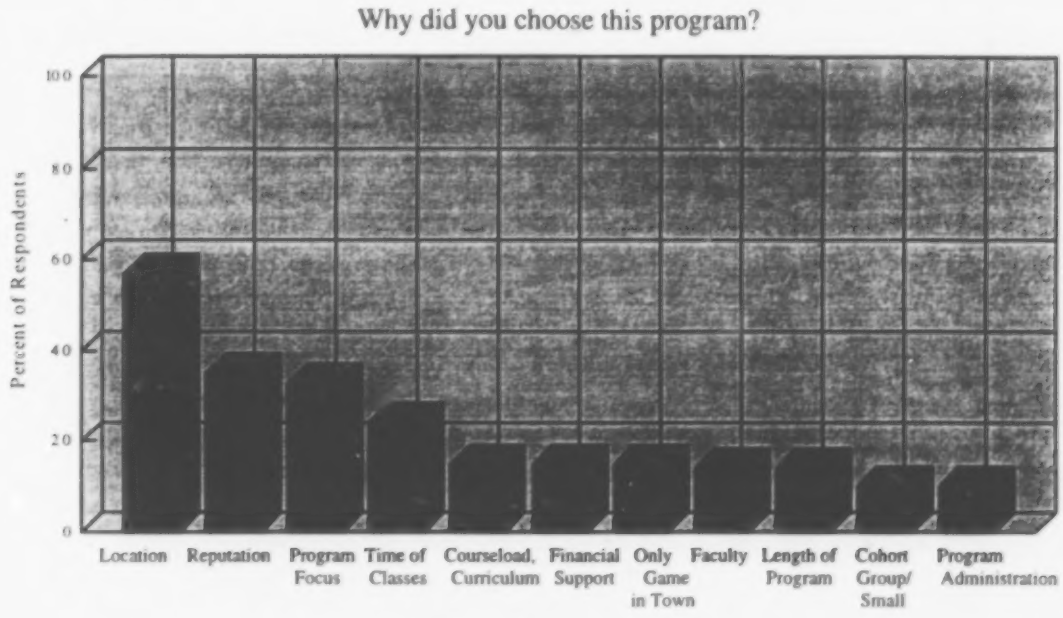
There are two main institutional settings that are of primary interest in an alternative route program: the participating schools and school districts and the college or university which supports or provides the professional component of the program. In our case studies we described the buildings and the physical settings of the programs. We realized, however, that the environment, the atmosphere and the relationships among the participating institutions were also important. Recruitment, retention, placement after program participation are all related to the characteristic of setting, according to our research on these programs. Program coordinators express this message in their recruitment materials, stressing how these factors are useful to students and school districts.

The relationships between the programs and the cooperating school districts are an important aspect of setting. In most teacher preparation programs, connections to more than one school and more than one school district are critical to place students at their preferred level and location. In addition, most of these alternative programs require students to participate in early field experiences in more than one school location. Therefore, the capability of the program staff to place students in a variety of settings is critical to achieving the pedagogical and even the selection goals. For the Dominguez Hills program, early and intense observations were thought to be key to determining which applicants were willing to step into the real world of the schools. In the Crystal City Program, the Office of Laboratory Experiences for the University is staffed by an experienced educator who works as a liaison, with an understanding of the idiosyncrasies of each cooperating school district. In addition, the faculty and program coordinator were able to pilot a student teaching internship cluster in one county. In the Colorado program, the co-director's experience with the teachers and principals of the area schools and her experience working with other localities has enabled her to place students in pairs, and take the entire cohort to a rural area for a living and working field experience. At the Digital transition program, the track record of relationships between area schools, Digital, and the company assisting in the production of the transition workshops provided access to schools for field visits and for the location of transition program meetings.

For the university-based programs, the location of the courses students must take is an important issue to potential participants. In general, students are willing to travel an hour or more for a special observation or course, but they seem to prefer to be located within easy commuting distance when the program is an all-day cohort program and particularly when teacher internships begin, which are entirely dependent on school schedules.

In fact, a survey shows that most teacher education students come from homes near campuses where they are enrolled--slightly more than 73 percent were enrolled in schools 100 miles or less from their home (American Association of Colleges for Teacher Education 1989). Location was

listed by 57 percent of the AASCU survey respondents as a reason why they chose their particular teacher education program. A few students in the full-time cohort programs were willing to relocate to the area of the higher education institution to participate in the program. For those already in the area, proximity to the students' home and work is important, regardless of other aspects of the setting. However, location isn't everything as some students of the CSU, Dominguez Hills program drove two hours to attend classes, and one Mills College MCMS program alumnus came from Germany to enroll in the program (she now teaches in South America). For part-time programs, like the George Washington University program, location is especially important as participants need to be able to travel between their jobs and classes in a minimum amount of time. In fact, over three-fourths of the GW students noted that the location of the program was its primary attraction.



The reputation of the program and the program focus were also cited as reasons for choosing a program by over 30 percent of the respondents to our survey. For some programs, like the Colorado and Mills programs, this was more important than the location. This information coincides with the 1989 AACTE survey results as 44 percent of those respondents thought that reputation was a factor in their decision; an additional 38 percent reported that the time of the class offerings (part-time, in the evenings) was influential (American Association of Colleges for Teacher Education 1989).

These statistics highlight the fact that students generally do not review several teacher education programs and choose the one that they believe will give them the best education. They usually attend a program for other reasons such as, recruitment activities, location close to home or work, and the financial support available.

Beginnings

Each of the programs that we studied began in a unique way, however, they share these characteristics: the program was begun outside the regular teacher education undergraduate program, the program was conceived to respond to a need for a different delivery system for adult students, the program was begun with the support of the institution in which it was located and some funding assistance for student scholarships and curriculum development was obtained from external sources, the program faculty were regular full-time faculty and they were supplemented with adjunct faculty from schools and other professional settings, and graduate assistants augmented the instructional and administrative needs. In each case, the program has developed in some way beyond its original shape and content; the student bodies are more varied, the additional outside support has been earned and/or the program has gained recognition, acceptance by faculty has increased, program level has changed to a graduate one, there has been increased involvement of the schools in the preparation of the student teachers.

There does not seem to be one "right" way to initiate a program. However, Linda Darling-Hammond warns that "narrow targeting of recruitment pools that allow programs to tailor their approach can backfire if the target pool shrinks" (Darling-Hammond, Hudson and Kirby 1989, xi). In fact, the George Washington University and Colorado State University have expanded their selection pools by making it possible for students to take methods courses in disciplines other than math and science through the regular teacher education program. Mills has maintained its math/science distinction, as has CSU, Dominguez Hills. By ending its own program, the Digital Equipment Corporation changed the options for the target pool they had originally sought to assist.

Perhaps one of the valuable lessons learned about development can be seen through the comparison of programs at the George Washington program and at Digital. The GW Crystal City program was originally narrowly targeted to the military. But the University soon recognized that other students in the area needed a part-time program and gave its official support to that program by naming it the official graduate part-time program. Digital began its Engineers Into Education program with a generous employee subsidy and an elaborate transition experience, but as the company's fortunes declined, the support was withdrawn, ending in the postponement and eventual termination of the program. This meant that different cohorts of participants received varying benefits and assistance. If the transition program had been more selective and more limited from the beginning, the effort might have been sustainable over the toughest times of the company.

We have learned that, even if the program begins outside the main teacher education route within a university school of education, it is important to plan for its integration or institutionalization. If the program stays on the fringe of the university or college, then it will be viewed as vulnerable and eminently dispensable. It will be difficult to get and keep the support of school systems which need to count on the supply of graduates, without a commitment by the institution and its administrative representatives. A reputation needs to be built. Some respondents to our survey reported that a strength of their program was its reputation: i.e., it made finding a job upon completion easier. According to Arthur Wise, "creating focused, targeted programs is not enough...if programs that accommodate nontraditional students are to become a dependable source of teachers, they must be institutionalized" (Darling-Hammond, Hudson and Kirby 1989, iii).

A good example of the role of the dean in the institutionalization of an alternative program comes from the GW Crystal City part-time program. The program was administered by the Division of University Programs. The School of Education and Human Development already offered a

number of alterative routes to teacher certification. Working within the establishment, the dean was able to gain status for the part-time program and reported exercising his influence on the way the student participation and faculty time is counted within the record-keeping system of the university to "dignify the work of my faculty." The dean believed programs like the Crystal City one should pull the university to a new place. He believed that then the program can be institutionalized without the loss of its identity.

Another force in the development for these programs has been the influence or needs of external agencies, whether governmental or nongovernmental. In the case of Dominguez Hills, the interest of Private Industries Councils in taking advantage of an alternative route program to address the needs of displaced workers gave the program additional, younger cohorts. In Colorado, the submission of the program to a state "competition" for recognition with the support of the university and the subsequent award of that recognition gained the program visibility and status it was seeking. However, there were no additional financial resources made available.

Program Objectives

The programs we visited share some important objectives. They are also distinguishable one from another by the additional, specific objectives they have formulated around the preparation of beginning teachers.

In the following table, the objectives of each program are laid out for comparison. This is followed with some discussion of the distinctive aspects of the programs, the differences in their curricula and with the student opinions regarding the accomplishment of these objectives.

Goals, Objectives, and Developmental Themes, by Program

California Mathematics and Science Teacher Corps Project, CSU, Dominguez Hills, Calif.	Mid-Career Math and Science Teacher Preparation Project, Mills College, Oakland, Calif.	Crystal City Secondary Teacher Education Program, George Washington University, Virginia	Project Promise, Colorado State University, Fort Collins, Colorado
1. Evaluate, promote, apply research-based practices 2. Exhibit skill in providing equal learning opportunities for all students 3. Develop curricula and higher order cognitive processes 4. Encourage collaboration/cooperation among learners 5. Exhibit cultural and linguistic sensitivity toward learners from diverse backgrounds 6. Balance theory, research and practice	1. Effective classroom practice based on sound theoretical foundation 2. Assessment of student needs and capabilities 3. Self-assessment, personal growth, and interpersonal skills 4. Establishing and maintaining a climate for learning 5. Understanding and appreciating context	1. Understand the philosophical and sociological foundations underlying the role and origin of public education in the U.S. 2. Study the theories of learning, teaching, and human development in the context of formal and informal education 3. Study teaching techniques and skills 4. Study theories and strategies of classroom management 5. Utilize and develop curricular materials 6. Study the assessment techniques used to evaluate student achievement 7. Recognize the importance of a blend between theory and application	1. Understand self as person and teacher 2. Understand students as individuals and learners 3. Understand the instructional process and teacher behavior that increase the possibility that students will be personally and academically successful 4. Prepare students for the job search process, engaging them in this process and then processing their experience 5. Provide objective evaluations for participants through external evaluators.

All of the programs embraced the goal of increasing the number of qualified mathematics and science teachers and thereby positively affecting the math/science education of U.S. students. Through recruitment and selection activities, programs were able to attract and admit candidates who would fit the statement of this goal. From this common goal, the programs diverged and developed, taking different paths in terms of program of study required, diversity in the population of students, relationships to schools of education, and the visions of its directors and coordinators. Eventually, this focus on math and science also changed for some programs, broadening to include other disciplines.

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The George Washington University and CSU, Dominguez Hills programs were the most traditional in terms of requirements and curriculum. They started with the required course core from their traditional and fifth-year programs. Additional subject matter prerequisites were obtained through the university or through neighboring colleges, after a process of academic advising. Thus, the traditional curricula were made to fit the needs of the retirees and part-time military who were the original student participants.

The Digital program, with its captive audience of technical professionals, combined career counseling with extensive information about the world of schools. Of all the corporate-sponsored programs existing at the time of this study, Digital's provided the greatest level of financial support to participating employees.

The Mills College and the Colorado State University programs developed entirely new programs based on principles and lessons learned from current educational reform movements. As the dean of the School of Occupational and Educational Studies (SOES) at Colorado State commented, "At the heart of the reform movement is the idea that there be a direct connection to practice." Both Project Promise and the MCMS program are located collaboratively within the university and the schools it served, and Mills built its curriculum with the help of both school professionals and scientists. The Mills College program made its own special effort in the development of guided-discovery methods courses, an integrated concept of science content, and in its cooperation with both school teachers and scientists at the Lawrence Hall of Science for course development. The Colorado State University program made its unique contributions in the area of field experience, academic exploration of diversity and assessment of program participants.

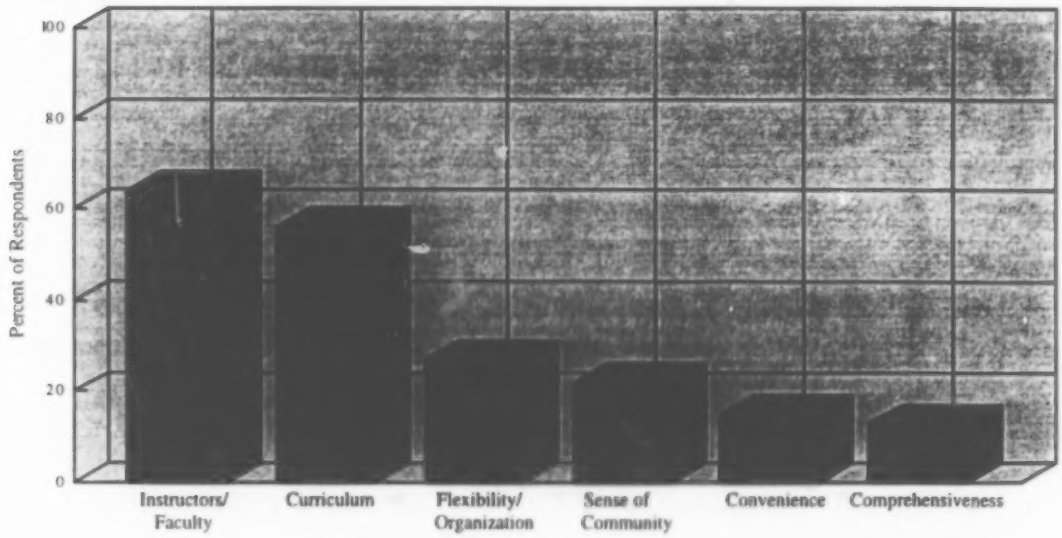
All of the alternative route programs we studied, however, show a conviction that teacher education programs should be reformed by attending to the areas of development which are getting a great deal of attention by teacher educators now: increased and various observation and internship opportunities; involvement of other faculty and cooperating teachers in the preparation program; special trust-building for the student cohort; authentic and qualitative assessment of students; variations of content delivery which meet the needs of adult and nontraditional clients.

A question raised often by researchers about the curriculum for alternative programs is that if it is too abbreviated how can it represent an improvement over the traditional preparation curriculum? The program directors in our case studies have shown they can adapt the best of new and traditional theories to an intensive and even cohort-based program. This application is supported in the research literature, for example, a study by Freidus and Krasnow (1991) on the Program for Second Career Teachers at Manhattanville College and a study by Hassard (1989) on a program called the Georgia State University Alternative Certification Program. Both Manhattanville and Georgia State University programs developed their philosophies from the theory of interaction between self, society, and school espoused by John Dewey. Even with a shortened classroom time (both are paid internships for one year with surrounding coursework and special seminars) the programs are able to focus on building reflective practitioners and have made efforts to understand the changes in beliefs and knowledge experienced by the students in their small cohorts. This is accomplished by integrating the content of courses which would ordinarily stand on their own. There are multiple advantages to this: the faculty work on integrating pedagogical knowledge, students with different academic backgrounds help each other, studies are not seen in isolation from the total knowledge base of the discipline. There are disadvantages too, however, students receive compressed information and report they cannot absorb it all in such a short amount of time. They

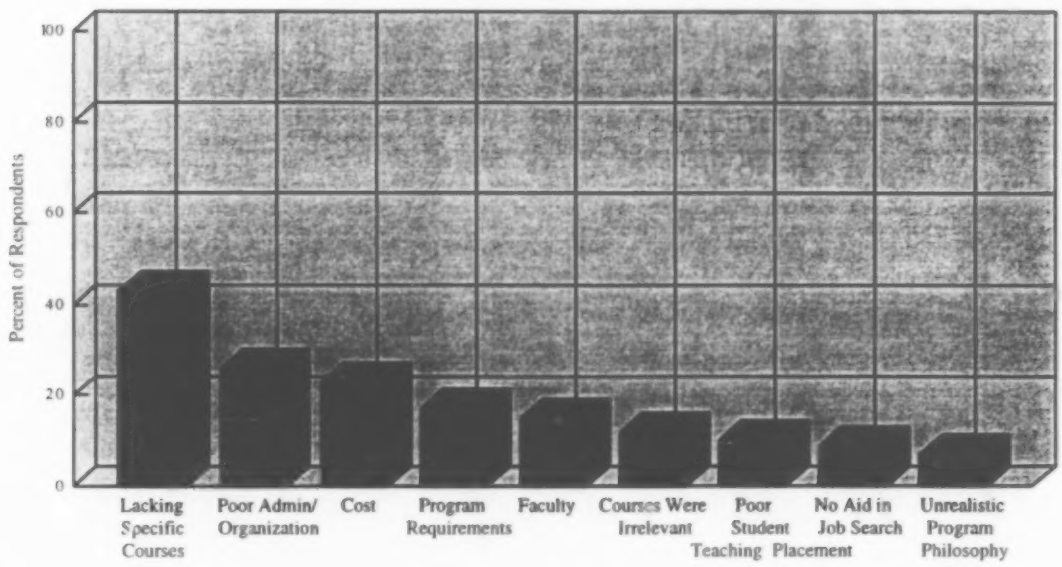
request classes start earlier in the program time-schedule so they can be prepared to enter schools before the year begins and they request more time in schools observing and working with teachers.

The students who responded to our survey reported they were attracted to the programs we studied because of their unique philosophies and curricular features. To assess how well the educational objectives of the programs were achieved, we looked at the students' perceptions of their training and their subsequent working experience.

What are the strengths of your teaching program?



What are the weaknesses of your teaching program?



The main strengths of the teaching programs were reported to be the instructors and faculty, 64 percent, the content and its applicability, 56 percent, and flexibility/organization of the program, 27 percent. The weaknesses identified by the participants were that the program lacked specific coursework (43 percent--classroom management was mentioned the most often), that the program had poor administration, 26 percent, and that cost was too high, 23 percent. In the survey, a definition of "poor administration" was not provided. Our thinking behind this item was that lack

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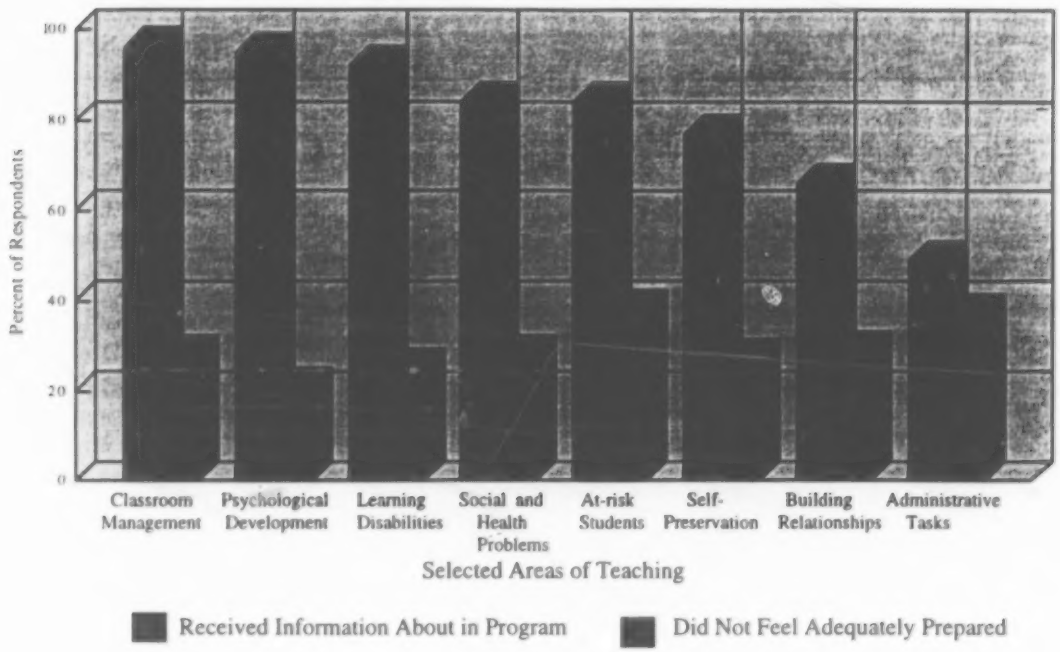
of organization, shortage of support, and tenuousness of the program status might be the negative side of the flexibility, nontraditional style and collegial relationships among students and program faculty and coordinators which were the hallmarks of the programs we visited. In fact, students did find that some inconsistencies in information dissemination, changes in requirements, lack of follow up, and lack of support were negative aspects of the nontraditional programs.

How prepared were you in certain areas of teaching?



Respondents to our survey were asked to fill out a matrix relating whether they received information on a subject and the level to which they felt prepared in that subject in the classroom. Ninety-six percent of the respondents reported that they had received information on classroom management during their preparation, but over one-quarter of the respondents did not feel adequately prepared to handle that aspect in their classroom. Additionally, while 85 percent received information about at-risk students, 38 percent did not feel adequately prepared to teach these students. Just under half of the respondents received information on administrative duties as a teacher, and more than one-third of the respondents did not feel adequately prepared to handle those tasks once in the classroom. (It is important to note that while we asked whether the respondent had received information on a topic, we are not able to discern from the survey response the depth to which the topic was covered in the program.) It is interesting to note that while all participants had at least a bachelors degree in a discipline, and over seventy percent of the survey respondents reported receiving information on content during the program, 11 percent did not feel adequately prepared to cover the content in the classroom.

The research reviewed for this study endorses the needs expressed by our survey respondents. According to Darling-Hammond, Hudson and Kirby, the programs that provide substantial pedagogical coursework before recruits enter the classroom and provide supervision and graduated

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assumption of responsibility during a practicum "are more effective in the eyes of their participants and graduates" (1989, 80). This study of alternative programs and participants also found that they view subject area coursework to be about as valuable as education coursework, even though these individuals are presumably already knowledgeable in their subject area. In every study reviewed for this report in which program graduates were asked to evaluate their program, the need for more concentration on classroom management knowledge and skills, more information about special student needs, and guidance as to how to work within the sometimes depressing conditions of teaching were reported. At the same time, they were enthusiastic about the direct relationship between theory and practice in nontraditional programs (which also might be shortened versions of traditional programs) and the encouragement they had received from faculty regarding their abilities to apply work experience to the demands of the teaching role.

Recruitment and Selection

Program selection criteria differed and individual decisions were made on a case-by-case basis for all the programs we visited. However, in general the program coordinators believed they knew the qualities they were seeking in good teachers and through interviews, writing exercises, and in group discussions, they sought to determine whether the basis for good teaching was there in each candidate. Project Promise had the most elaborate model of selection based on competencies believed to be strong predictors of good teaching. George Washington looked for motives and beliefs to come out during group interviews. Dominguez Hills interviewed and brought candidates into schools immediately to determine their intent. Even the Digital transition program requested an academic plan from prospective participants and sought to clarify the applicant's goals and intent to pursue a career in education.

However, because the objectives of many alternative route programs are more broadly described as to recruit qualified individuals into teaching, there is generally less emphasis on the selection process and more attention paid to meeting grade point average, testing, and minimum academic requirements. When scrutinous attention is paid to selection of candidates, it has the effect of keeping the number of participants low. In fact, the small university-based alternative programs that involve elaborate selection efforts have typically 15-20 participants in a cohort.

The Participants

Research on participants in nontraditional programs has been rich in information, not just reporting their demographics, but also their views of teaching, their career experiences, and their development as professionals. Nontraditional programs reportedly do well in their appreciation for the diversity of their participants.

The programs we studied differed in the extent to which they strive for racial and ethnic diversity in the students they accept for each class. While there were alternative route programs which focused on recruiting minorities into teaching, none of the programs we visited had this explicit goal. At the same time, they were aware of the low numbers of minorities choosing teaching as a profession and the disparity between the cultural backgrounds of the prospective teachers and the populations of students they would be teaching. So the program directors aimed broadly with their recruitment efforts and publicity and sought to provide students with academic and observational opportunities to address diversity issues. Administratively, the programs were less

successful in their recruitment of minorities than in their development of diverse in-school experiences. Students had their own opinions about their fellow classmates and about the faculty. Students at Mills College for example, reported that diversity in the program was lacking. One survey respondent even proclaimed the program was "too White!" This perception belied the data, since Mills College had one of the more diverse programs, in terms of student representatives from different race and ethnic groups. The faculty members that we met at Mills College were indeed all white, and mostly female. Since the time of the survey, Mills College has employed a black female as the MCMS program director. In both the Colorado State University and George Washington University Programs, most of the faculty were white, as were most of the students.

The case studies of alternative route programs undertaken by Darling-Hammond and her colleagues found that nontraditional programs do not draw a large number of retirees, but that these recruits bring more demographic diversity to the field (Darling-Hammond, Hudson and Kirby 1989). The nontraditional recruits were more likely to be older, male, and members of a minority group when compared with traditional students. We found, however, that because of the economic times in which they began and their objective of responding to military draw-downs and industry retrenchments, as well as their desire to attract science and math professionals, our case study programs tended to attract older white males. These were the individuals changing jobs and retiring from the military. Thus, our research does not support the Darling-Hammond finding of an increase in minority group participation as an outcome of the development of alternative route programs in general.

Still another participant issue is that of distinctiveness of experience. Researchers have asked the question: should second-career program participants be different from those in a "first career" group? Should programs be trying to make second-career individuals more like the first career group? What are the characteristics which these nontraditional students impose upon the program and the schools and, on the other hand, what are some advantages of their knowledge, maturity and experience?

In the Madfes study (1991) of the ENCORE Program (Chevron supported program) at three universities, the transition made by second-career teachers was contrasted with that made by first-career teachers. Madfes pointed out that the short decision time available to some second-career teachers before entering a program could lead to their dropping out of a program earlier than first-career participants, as could the lack of financial support. While second-career teachers do get jobs (this is supported by all studies we reviewed) their long-term commitment, while expressed in research surveys and interviews, is yet to be determined and will need to be compared with the longevity of first-career teachers.

Second-career teachers do not automatically transfer their experience and competencies from one career to the new teaching one. Rather, Madfes (1989) and Freidus and Krasnow (1991) suggest this happens more gradually, as confidence builds and the professional role seems to open up to strategies learned in other work settings. However, some basic organizational and strategic skills inherent in the jobs of most professionals, are likely to be applied immediately and instinctively.

Madfes suggests it is the very conditions of teaching themselves which affect the transition and retention of second-career teachers. If their program supports them by early exposure to adolescents and real-life conditions, provides enough background in communication techniques, conflict resolution, and management techniques, and assesses skills carefully in subject specific pedagogy, the second-career teachers should be able to make the transition just as well as those emerging from traditional undergraduate programs.

A slightly different perspective is offered by Freidus and Krasnow who say second-career teachers are qualitatively different from the first-career group. Through self-portraits and surveys of participants in a number of college programs, these authors have gleaned the knowledge that programs must take into account "how they (the students) see themselves, the careers they are leaving, and the careers they are choosing" (1991, 2).

These authors address the changing views of career in our society and the acquisition of skills from related or diverse fields. They point out we should not be saddling these teachers with a label of "career changer" as if they are simply moving from one job to the next. Teaching is a purposeful choice for a group of individuals who wish to serve society and see themselves as agents of change. The participants in Freidus and Krasnow's study have family who have been or are now teachers and they see themselves as representing their family values. We found this to be the case as well for some of the students we met and observed.

The research we reviewed has shown there are many possible audiences, or students, for nontraditional programs: retired military, retired engineers, actual mid-career switchers, and homemakers, among others. People who made career decisions decades ago now have a new and exciting opportunity open to them, the profession of teaching. Katherine Merseth, in a discussion of mid-career professionals moving into teaching notes that "many individuals in this age bracket have economically--and psychologically--'plateaued' in the corporate world and would welcome an opportunity for new challenges." (Merseth 1986, 4) Evaluations of state-supported alternative certification routes in Texas showed highly motivated interns (Barnes, Salmon and Wale 1989). A higher percentage passed the required certification tests than in traditional programs, a larger proportion were minority candidates, and their unique contributions to the schools where they interned convinced principals and supervising teachers that they were indeed assets. The maturity of second-career teachers may mean they have a higher level of teaching readiness. Their previous experience and their work history as reflective professionals may help them adjust quickly to the real world of schools. Their potential for development is already higher and is accelerated by faculty who guide their development, according to the research we reviewed. Whether schools will make use of their strengths is a researchable question.

The participants of the four teacher education programs that we studied were varied in their backgrounds and interest, as we found from the survey we administered. The average age of the survey respondents was 44, however this number varied per program with 37 as the average age at the Colorado State University program and 63 as the average age at the California State University program. Seventy-seven percent of the respondents were male and 75 percent were married. Sixty-eight percent reported having children. Four percent reported being members of minority groups. It should be noted that when programs do not concentrate on retired military or engineers, they tend to have a younger, more diverse participant population (for example, 11 percent of the survey responses from Mills College were from minority participants).

As might be expected, the educational background of the respondents was strong, as all reported having bachelor degrees and over 57 percent had a master's, first-professional, or doctoral degree. In addition, their work experience was impressive and various. Over half of the respondents had been in the military sometime in their career and others had been engineers, health-field workers and managers. On average, these respondents had a salary of $52,199 before they entered their teaching program.

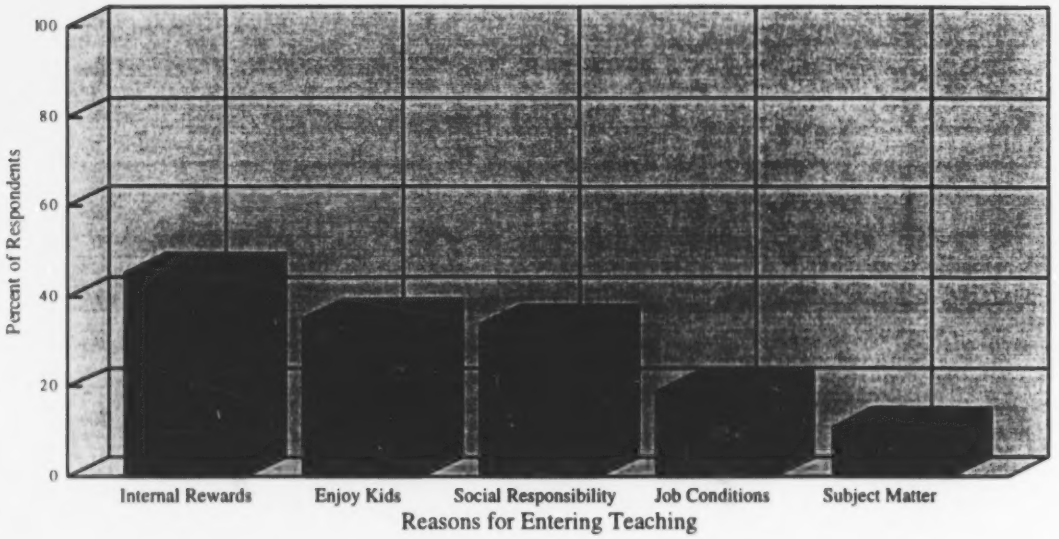
One of the programs studied involved only retirees, and another included many military retirees, however, this subgroup may not be a consistent source of students. In the study of

nontraditional programs, Darling-Hammond and her colleagues noted that "programs that initially focused on retirees have usually had to turn to other sources of recruits to maintain their enrollments" (Darling-Hammond, Hudson and Kirby 1989, xi). Additionally, Darling-Hammond notes that homemakers appear to participate in nontraditional teacher education programs in very small numbers. We found only two participants who had been in unpaid professions before entering their teacher education program--a homemaker/mother and a full-time volunteer. We also have noted previously in this report that most of our case study programs expanded their original participant pool and maintained their enrollment level.

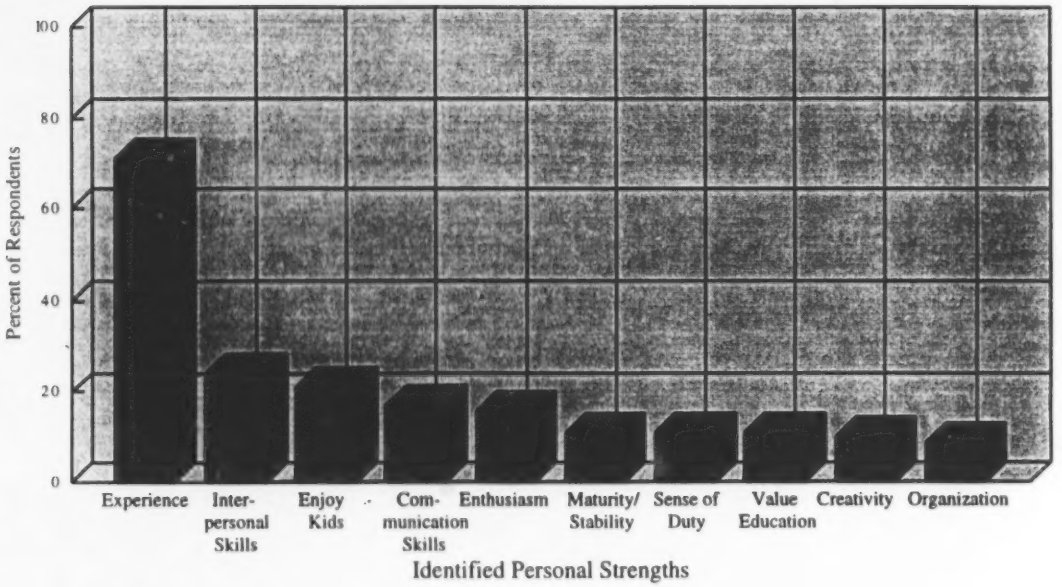
About 90 percent of the survey respondents reported having previous teaching experience. This teaching experience ranged from training others as part of their job, 54 percent, to volunteer tutoring, 36 percent, to coaching, 33 percent. More than one-third of the respondents had considered teaching previously--reasons why they did not pursue the profession ranged from being drafted, to becoming pregnant, to fear of financial difficulties.

We asked the respondents to tell us why they entered teaching. Forty-five percent referred to the incentive of an internal motivation, such as "I always wanted to" or "It would be a challenge." Another 35 percent entered teaching because they enjoy kids, and 34 percent stated that they felt a social responsibility to enter teaching--a pay-back to society for their own good fortune and success. Nineteen percent thought that the job conditions (summers free and hours of school teaching match children's hours of attendance) were part of their decision to enter the profession. Interestingly, only 11 percent mentioned the love of the subject matter as a reason for becoming a teacher. Answers to this question varied by program, however. The older participants, retirees from military and engineering jobs, were much more likely to report that they wanted to "pay back" society. Also, the Mills College program participants were more likely to report "love of subject matter" more than any other program participants. The reasons for this needs to be examined further, but it might be because the Mills College program focuses on the math and science content of teaching and reintroduces the participants to many issues in math and science.

Why did you enter teaching?



What strengths do you bring to the classroom?



When asked about what skills or knowledge they could bring to classrooms, 71 percent of the respondents believed that their life experience in applying knowledge to a problem would be an asset in the classroom and just over 24 percent thought that they had developed interpersonal skills that would serve them well as teachers, such as empathy and caring.

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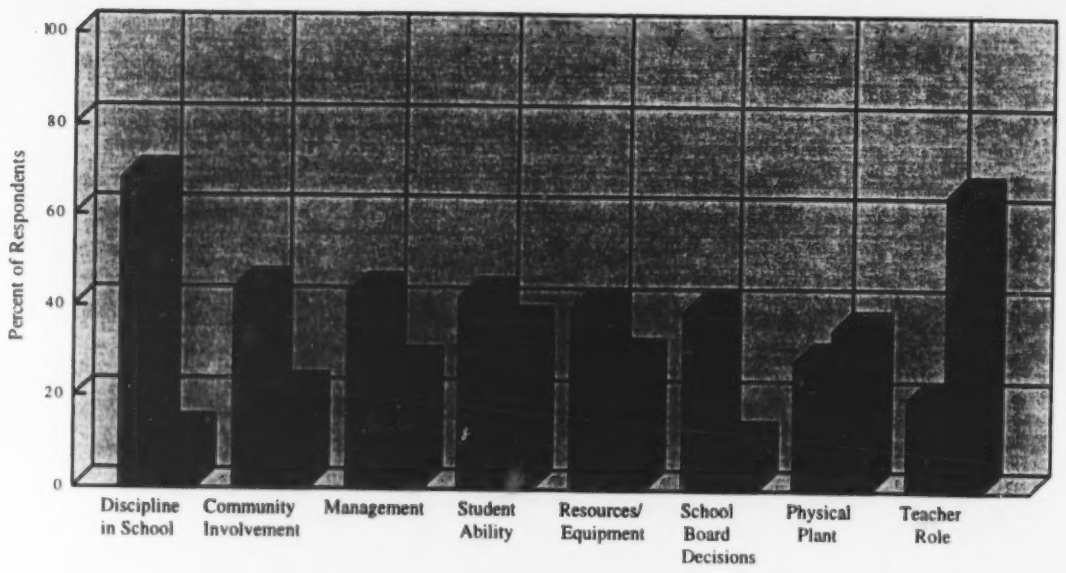
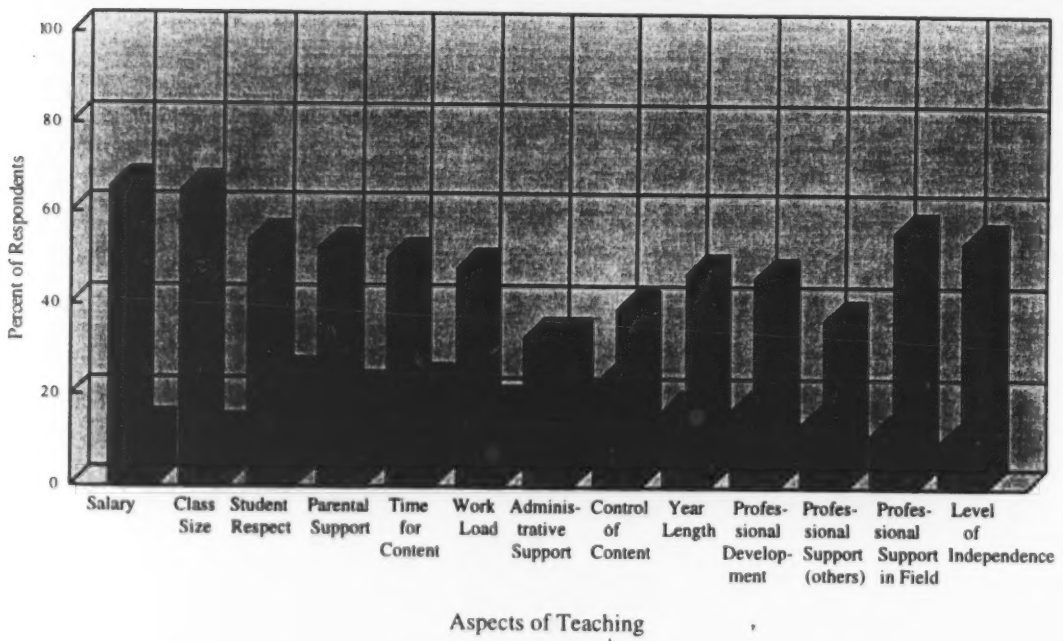
What is your opinion about various aspects of public schools?



What is your opinion about various aspects of teaching?

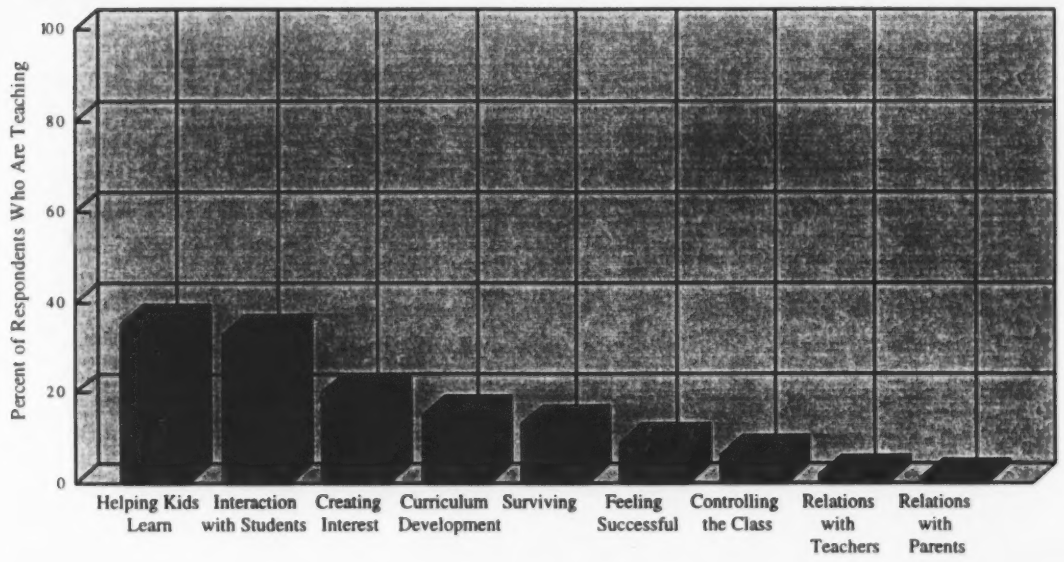


All of the respondents, whether currently in a program or graduated, were asked for their opinions of public schools and of the conditions of teaching. Looking at the respondents' opinions of public schools, we found that over two-thirds of them had "negative" or "very negative" opinions of the discipline in school. Community involvement was the second-most negatively viewed aspect of public schools, with 44 percent reporting that they found it "negative" or "very negative." However, nearly two-thirds of the respondents reported having "positive" or "very positive" opinions of the teacher role and responsibility within public schools.

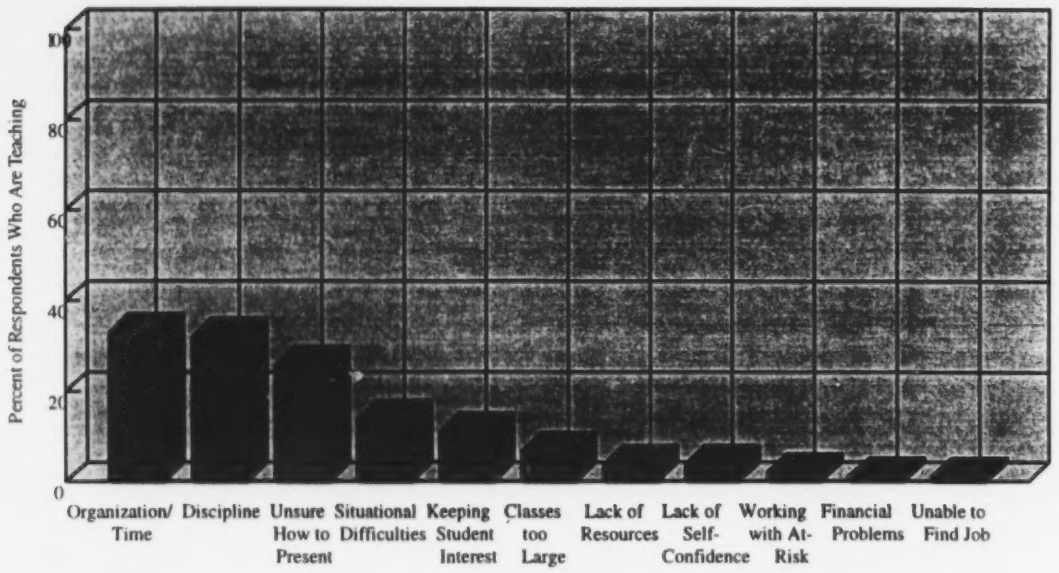
Opinions on the conditions of teaching were varied. Not surprisingly, two-thirds of the respondents felt "negative" or "very negative" toward the salary a teacher receives and toward current class sizes. Participants from Mills College were more likely to rate their opinion of current class sizes as "negative" than participants from other programs. Of those survey respondents who were employed full-time in public schools, the average salary was $26,376, marking an average decrease of $16,086 from their previous salary. Additionally, over one-half of the respondents felt "negative" or "very negative" regarding student respect for teachers, the level of support from parents, and the amount of time for content in the classroom. The California State University, Dominguez Hills participants were generally more positive about conditions in the schools, particularly in regard to student respect for teachers (more than half reported having a positive opinion about it). Perhaps it is because none of these respondents had yet to hold a full-time teaching job. Opinions about the level of support from professionals in their field and the level of independence/autonomy were reported as "positive" or "very positive" by more than one-half of the survey respondents.

Lessons Learned by Participants

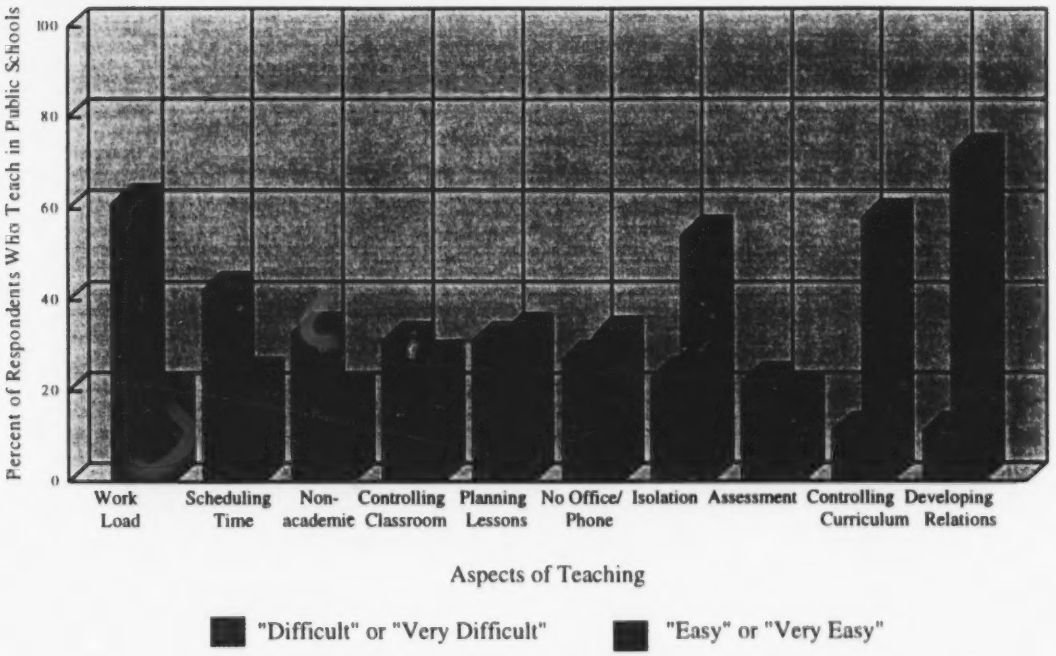
What was your greatest first-year success as a teacher?



What was your greatest first-year problem as a teacher?



How difficult was it to adjust to various aspects of teaching?



We asked the respondents who had completed, or were at least in the midst of, student teaching what their greatest problems and their greatest successes were in their first year of teaching. Organization of their time and classroom management were both mentioned by about one-third of

the respondents to be one of their greatest problems. Another 26 percent reported that not knowing how to present the material in class was a problem for them. As for successes, 35 percent thought that they were most successful when they helped kids to learn and/or understand. An additional one-third of the respondents stated that having good interactions with students was their greatest success. Some respondents just plainly stated "I don't feel too successful," and "I haven't had a success yet."

In order to aid other professionals in their consideration of making a career change into teaching, respondents were asked to give advice to people considering a mid-career switch into education. The advice they gave was to 1) visit several programs, ask questions, and compare, 2) check with the state requirements and with the local schools to see where the needs are, and 3) spend time in the public schools before you make a change.

We asked these respondents how they adjusted to certain aspects of teaching. Sixty-one percent found adjusting to the "demanding work load" to be "difficult" or "very difficult." Interestingly, only 27 percent found adjusting to "not having an office or phone" to be "difficult" or "very difficult." Over 70 percent found it "easy" or "very easy" to adjust to "developing teaching peer relationships." And, it was surprising to note that over 50 percent reported it "easy" or "very easy" to adjust to the isolation.

Of these teachers, nearly 70 percent stated that they "maintain a collegial relationship" with their former coworkers, however, just 29 percent involve their students or teaching peers with the colleagues at their former job through visits, guest speakers, or material borrowing. It was conjectured that these new teachers would be a great asset in the schools because they would bring their knowledge and their contacts of the "real world" into the classroom. It appears that only about one-third of these teachers are doing that. But, it is important to remember that these teachers have been in classrooms only one to two years and their practices and opinions may change over time.

Of the respondents who decided not to enter teaching, just over 70 percent thought that they might teach later in life. They chose not to at this time for various reasons, including the relatively low teachers' salary, too heavy a time commitment, personal situations, and other job opportunities. According to our respondents, if paid part-time teaching opportunities were available in the public schools, some of these respondents would be likely to enter teaching, especially those who are currently retired.

Comparison of Program Participants

	California Mathematics and Science Teacher Corps Project	Project Promise	Crystal City/Tide Water Teacher Education Program *	Mills College Mid-Career Math and Science Program
All Respondents (current students and graduates)	**(n=15)**	**(n=18)**	**(n=99)**	**(n=28)**
Average age	63	37	44	41
Percent male	100.0	66.7	88.8	29.6
Percent white, non-Hispanic	93.3	94.4	97.9	88.9
Percent ever married	100.0	66.7	86.2	88.5
Percent with children	100.0	33.3	73.7	53.6

Percent with master's or higher degree	86.7	33.3	66.6	25.9
Percent with field of degree in math, science, or engineering	100.0	38.9	38.9	73.0
Average salary before entering program	$ 83,867	$ 30,028	$ 55,764	$ 36,044
Main reasons for entering teaching profession	Enjoy Kids and Social Responsibility	Internal Rewards and Enjoy Kids	Internal Rewards and Social Responsibility	Internal Rewards and Love of Subject Matter/Learning
Main reasons for choosing specific teacher education program	"Only game in town" and Availability of financial support	Length of program and Program focus/philosophy	Location and Reputation	Program focus/ philosophy and Location

Respondents Who Are Currently Teaching in Public Schools

	California Mathematics and Science Teacher Corps Project	Project Promise	Crystal City/Tide Water Teacher Education Program *	Mills College Mid-Career Math and Science Program
Respondents Teaching Full-time in Public Schools	**(n=0)**	**(n=9)**	**(n=18)**	**(n=9)**
Average age		37	43	36
Percent male		77.8	94.4	22.2
Percent white, non-Hispanic		100.0	94.1	77.8
Percent ever married		66.6	83.3	88.9
Percent with children		22.2	77.8	33.3
Percent with master's or higher degree		33.3	66.7	33.3
Percent with field of degree in math, science, or engineering		33.3	47.0	77.8
Average salary before entering program		$ 28,944	$ 57,125	$ 29,900
Main reason for entering teaching profession		Internal Rewards and Enjoy Kids	Internal Rewards and Social Responsibility	Internal Rewards and Love of Subject Matter/Learning and Job Conditions

	California Mathematics and Science Teacher Corps Project	Project Promise	Crystal City/Tide Water Teacher Education Program *	Mills College Mid-Career Math and Science Program
Percent teaching math		22.2	66.7	11.1
Percent teaching science		44.4	44.4	88.9
Percent teaching in rural schools		50.0	6.7	0.0
Percent teaching in urban schools		25.0	26.7	62.5
Average teaching salary		$ 22,983	$ 27,648	$ 27,367
Percent who report that they have adequate resources in school		77.8	72.2	22.2
Main first-year teaching problems		Organization (not enough time) and Classroom management/ discipline	Unsure how to plan lessons, Organization (not enough time), and Classroom management/ discipline	Organization (not enough time) and Classroom management/ discipline
Main first-year teaching successes		Helping kids learn/understand and Creating interest/love of content	Helping kids learn/understand, Creating interest/love of content, and Good interactions with students	Good interactions with students, Creating interest/love of content, and Developing curriculum/ materials
Reported Strengths of Teaching Program	Instructors/ Faculty and Flexibility/ Organization	Content (Applicable), Instructors/ Faculty, and Comprehensive-ness	Instructors/ Faculty, Convenience, and Flexibility/ Organization	Content (Applicable), Sense of Community, and Instructors/ Faculty
Reported Weaknesses of Teaching Program	Lacking Courses (NTE) and Program Requirements/ Inflexibility	Poor Administration/ Organization and Program Requirements/ Inflexibility	Faculty (Poor Models), Lacking Courses, Poor Administration/ Organization, and Cost	Lacking Courses and Courses Outmoded/ Irrelevant

*As explained in this case study, the Tidewater Program participants were also surveyed.

Percent of Program Participants, Who Are Teaching Full-time in Public Schools, Who Did Not Feel Adequately Prepared in Various Aspects of Teaching.

Aspects of Teaching:	California Mathematics and Science Teacher Corps Project *	Project Promise	Crystal City/Tide Water Teacher Education Program	Mills College Mid-Career Math and Science Program
content		11.1	16.7	0.0
content area methods		11.1	11.1	0.0
psychological development		11.1	12.5	44.4
learning styles		0.0	22.2	12.5
learning disabilities		22.2	22.2	62.5
handicapped students		33.3	22.2	57.1
at-risk students		22.2	61.1	62.5
social/health problems		22.2	55.6	33.3
resource utilization		11.1	28.6	14.3
administrative tasks		22.2	50.0	42.9
other duties (coaching, etc.)		11.1	33.3	50.0
evaluation tasks		12.5	37.5	25.0
classroom management		25.0	44.4	44.4
motivating students		25.0	44.4	16.7
self-preservation		37.5	35.7	37.5
building relationships		12.5	31.3	50.0

* No California Mathematics and Science Teacher Corps Project participants had entered the profession of teaching at the time of the survey.

Recommendations

We began this study with the idea that visiting university-based and industry-based alternative and transition programs could provide some valuable lessons about the recruitment and preparation of teachers from nontraditional populations. We hoped to learn about the programs, the participants, and their affect on the larger context in which the supply and demand of teachers and their preparation programs exist. In fact, we have discovered that many of the issues of preparation are the same as for traditional programs and that there is much to be learned from working with nontraditional populations of students and nontraditional programs.

Five questions posed here help us summarize the findings and the recommendations we have from this study.

- Is this the way to change the supply-demand quotient?

- Why establish and support alternative certification programs?
- How do alternative programs contribute to the teaching profession?
- How do alternative programs contribute to our understanding of career choice and career relationships?
- What remains to be discovered and researched?

Is this the way to change the supply/demand quotient? The answer to our first question is probably not. The number of graduates from these programs remains small. This is in contrast to the large number of individuals who achieve emergency or provisional certificates through alternative certification in general in states across the nation. In the short term, these specially established administrative routes will increase the supply of teachers. However, their requirements, along with requirements for traditional programs, have become more stringent, thanks to the pressure from teacher educators, their professional organizations, and state authorities themselves. These changes are likely to limit the entry into the profession to some extent, at least as it was pursued through the emergency, non university-based routes.

The debate about the supply/demand ratio persists, as the results of a number of studies of the supply/demand dilemma have been circulated. As recently as 1993, Recruiting New Teachers was reporting in their *Careers in Teaching Handbook* that data from a study by the Association of School, College, and University Staffing (ASCUS) indicated there was more of a balance across the states in the supply/demand of math and science teachers with some shortages reported in the area of chemistry (Haselkorn and Calkins 1993). The greatest shortages anticipated are in areas of special education. However, the ASCUS report notes that these regional data may have little reliability where the input from state respondents was limited. Therefore, even this study leaves us with a persisting need for data which answers this important question.

Finally, it is no coincidence that others have noted that alternative teacher education programs are more likely to begin at times when the labor market has an over supply of scientists and therefore these special programs will have trouble maintaining enrollments, once the labor market rights itself. It has been suggested that nontraditional programs may be the most successful at attracting new math and science teachers in times of high or rising unemployment in mathematics and science fields (Darling-Hammond, Hudson and Kirby 1989) We have found this to be the case both in our own case study sites and in the research of others. Without further research following the four education and training systems--the military, the public education system, business, and higher education--and the three forces of supply, demand, and consensus about the preparation of teachers, we will not be able to answer the question definitively.

Why establish and support alternative certification programs? Alternative certification programs that are university-based are contributing to both the institutions of higher education in which they are located (or with which they are associated) and to the knowledge gained by the profession about nontraditional students in general. In the programs we studied and in the reports from Madfes (1989), Barnes, Salmon and Wale (1989) and Hassard (1989), an increase in collaboration and cooperation among faculty and school personnel are noted as a benefit of such programs. Curricula tend to rely on integration and compression of information. To maintain quality and validity, a cooperative effort is required between faculty and practitioners. This is particularly true for the field experience and internship aspects of these fast-track alternative programs. Students expect to be in schools more (some are there from the beginning of the school year and intern for the

whole year) and this cannot be accomplished without bringing principals and mentor teachers into the planning and assessment process.

Universities are gaining, too, in their understanding of nontraditional students, their learning styles and needs. The data reported by Freidus and Krasnow (1991) are particularly poignant in this regard, pointing to the readiness of those choosing teaching as a second career as a great advantage to the flexibility and growth needed to function in the role of teacher.

Finally, when a program is begun from scratch, the opportunity to incorporate the best of practice and theory is hard to pass up. All the programs we visited started with a philosophy of the knowledge base and a concept of what a good teacher is. As Project Promise co-directors indicated about teacher education in general, "we know what a good teacher is, we are not so sure how to get there." These nontraditional programs have given education faculty a chance to bring the idea of standards and teacher competencies down to the program level. Although the programs we visited expressed their objectives in different words, at their foundation they see the development of the new teacher through an examination of self, students and school, and society.

How do alternative programs contribute to the teaching profession? The specific contributions of the curriculum (for example Mills College implementation of integrated science and math content pedagogy), assessment (Both Mills and Project Promise feature the tools of the future, such as portfolios and extensive processing of experience), close relationship between theory and practice (Project Promise and GW Crystal City with their variety of required observations and internships), and transition to the school world (Digital transition seminar, Dominguez Hills early field experience) are contributions which should not be overlooked by teacher educators. These programs continue to be laboratories for the standards to which the education profession is seeking to hold all programs.

How do these programs contribute to our understanding of career choice and career relationships? As Freidus and Krasnow (1991) point out, the traditional linear career has been supplemented by (1) the steady state career in which an individual acquires additional skills within a single field without upward movement (or outward movement) and the (2) spiral career in which an individual moves through positions in related or diverse fields. Hoping for a closer relationship between those who practice science, math or literature and art for that matter and those who teach it may not be the way to look at the issue of bringing talent to bear on improving education and the professions. Instead, we may need to consider that the understanding of different roles and the application of skills and knowledge from one role to another has a lot to do with individual histories and the working conditions of those roles.

Second-career teachers do not automatically and immediately apply what they knew from first careers to their daily lives as teachers, as our survey respondents told us. This was the finding as well in the studies of Madfes (1989) and Freidus and Krasnow (1991). The experience of teaching is all consuming and the application of other knowledge occurs gradually as one is established, gains credibility and confidence, and can open up to other strategies. Therefore, rather than force a relationship between people in different roles, it appears one approach is to bring them into collaborative efforts to improve educational contexts, curriculum, and assessment. This is likely to have lasting impact on the views each other holds of the many different ways of teaching and learning about science and math.

What remains to be discovered and researched? Many alternative programs have died out from lack of funds, lack of need, or lack of support from within institutions, while others have

continued, either because they have become part of the mainstream or the teacher education unit has embraced this approach. There are three primary areas that require additional research and study:

- What aspects of the alternative teacher education programs are responsible for their success?
- What are the long-term contributions of the programs' graduates to the students they now teach?
- How will these programs affect the teaching profession?

To responsibly answer these questions, we would need to reexamine the programs and their graduates after five years.

Teacher education exists in a political context and within an atmosphere of professional turbulence. Alternative programs and routes have been one byproduct of this political reality that have actually brought new information to teacher educators and fostered new relationships with schools and school personnel. While they will not solve the problems of supply and demand and will not bring the professions of science, mathematics and teaching necessarily closer together, they have brought hundreds of extraordinary people into the teaching profession. That is not a small contribution.

APPENDICES

Appendix A

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Survey of Mid-Career Teacher Preparation Program Participants

Section A: Personal Characteristics *(optional)*

1. Birthdate (mm/dd/yy): ____/____/____

2. Gender (M/F): ____

3. Race/Ethnicity: *(please check one)*
   - ❑ White, non-Hispanic
   - ❑ Black, non-Hispanic
   - ❑ Hispanic
   - ❑ Asian/Pacific Islander
   - ❑ American Indian/Alaskan Native
   - ❑ Other *(please specify)* _____

4. Marital Status: *(please check one)*
   - ❑ Married
   - ❑ Single
   - ❑ Divorced
   - ❑ Widowed
   - ❑ Separated
   - ❑ Other *(please specify)* _____

5. Number of Children: _____

Section B: Educational Experience

1. University you attended for the teacher certification program: *(please check one)*
   - ❑ California State University-Dominguez Hills
   - ❑ Colorado State University-Project Promise
   - ❑ George Washington University-Crystal City Program
   - ❑ George Washington University-Tidewater Program
   - ❑ Mills College-MCMS
   - ❑ Participated in Digital Equipment Corporation's Engineers into Education and enrolled in the certification or graduate program at: _____ *(institution)*

2. Month and year finished program (or expected to finish): _____

3. Please state your highest level of degree completed *(other than your teaching certificate/M.Ed.)*:
   - ❑ None
   - ❑ GED
   - ❑ High school diploma
   - ❑ Certificate
   - ❑ Associate Degree
   - ❑ Bachelor's Degree
   - ❑ Master's Degree
   - ❑ First-Professional Degree (i.e. law, medicine)
   - ❑ Doctoral Degree
   - ❑ Other *(please specify)* _____

   Field or discipline of degree listed above: _____
   Name of degree-granting institution: _____
   Year in which degree was earned: _____

Section C: Work Experience

1. What were your previous occupations before entering the teaching program? *(check all that apply)*

	From (year)	To (year)
❑ Manager/administrator	_____	_____
❑ Engineer	_____	_____
❑ Mathematician/scientist	_____	_____
❑ Social worker/counselor	_____	_____
❑ Health field worker	_____	_____
❑ Computer programmer	_____	_____
❑ Technician/research assistant	_____	_____
❑ Health-related technician	_____	_____
❑ Service occupation	_____	_____
❑ Production, craft, & repair occupation	_____	_____
❑ Military Officer	_____	_____
Branch _____	Highest Rank Held _____	
Other *(please specify)* _____	_____	_____
Other *(please specify)* _____	_____	_____

2. Annual salary at the most recent occupation listed above: $_____

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Section D: Teaching Experience

1. Please indicate your previous teaching experience before entering the teacher certification program, if any: (please check as many as apply)

	How Many Years?
❑ Volunteer tutor	_____
❑ Trained others as part of your job	_____
❑ Taught at the community college level	_____
❑ Taught at the college/university level	_____
❑ Taught K-12 in a public or private school	_____
❑ Coaching	_____
❑ Scouting	_____
❑ Other *(please specify)* _____	_____

If these categories do not adequately cover your previous teaching experience, please clarify:

_____

_____

Section E: About Your Decision

1. Why did you decide to enter the teaching profession?

_____

_____

_____

2. If you were teaching before you enrolled in the program, why did you decide to become certified?

_____

_____

_____

3. Did you consider entering the teaching profession at another point in your career? (Y/N) ___ If "Yes," in what year? _____
If "Yes," what were the circumstances surrounding your decision not to select teaching at that time?

_____

_____

_____

4. What strengths, personally or professionally, do you feel you have to offer in the classroom?

_____

_____

_____

5. What 3 characteristics of the program were the most influential to you in choosing the teacher certification program that you entered?

_____

_____

_____

Section F: Opinions of the Profession

1. How many years do you plan to stay in the teaching profession? _____

2. Currently, what is your opinion of the following aspects of public schools? *(please circle the most appropriate response)*

	Very Negative	Negative	Neutral	Positive	Very Positive
Management	1	2	3	4	5
Community involvement	1	2	3	4	5
Discipline in school	1	2	3	4	5
Resources/equipment	1	2	3	4	5
Physical plant	1	2	3	4	5
School board decisions	1	2	3	4	5
Teacher role and responsibility	1	2	3	4	5
Student ability/performance	1	2	3	4	5

3. Do any of these opinions of public schools differ from those you held before you entered the teacher certification program? (Y/N) _____
If "Yes," please describe the differences and the reason for your change in opinion:

_____

_____

_____

_____

_____

4. Currently, what is your opinion of the conditions of teaching? *(please circle the most appropriate response)*

	Very Negative	Negative	Neutral	Positive	Very Positive
Salary	1	2	3	4	5
Length of school year	1	2	3	4	5
Daily/weekly work load	1	2	3	4	5
Support from parents	1	2	3	4	5
Support from professionals in your field	1	2	3	4	5
Level of independence/autonomy	1	2	3	4	5
Support from administration *(principals, school board, etc.)*	1	2	3	4	5
Student respect for teachers	1	2	3	4	5
Class size	1	2	3	4	5
Time for content in class	1	2	3	4	5
Control of content	1	2	3	4	5
Support from other professionals *(counselors, school psychologists)*	1	2	3	4	5
Opportunities for professional development	1	2	3	4	5

5. Do any of these opinions of the conditions of teaching differ from those you held before you entered the teacher certification program? (Y/N) _____
If "Yes," please describe the differences and the reason for your change in opinion:

_____

_____

_____

_____

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6. Do you, or did you, find your knowledge of technological applications in your field helpful to you in your education studies? (Y/N) _____
Please describe why or why not:

_____

_____

_____

_____

Section G: Point in Your Teaching Career

The remainder of this survey includes sections relevant to certain stages in the acquisition of a teaching certificate (or the professional preparation and practice for teaching). Please read the following list describing this process, identify your position, and follow the directions for completion of appropriate sections, H, I, or J.

- ❑ If you are currently in a teacher certification program and have not yet participated in student teaching (internship), you are finished with this survey (do not complete any more of the survey). Thank you very much for your participation!
- ❑ If you are currently in a teacher certification program and are student teaching (internship) or have finished student teaching (internship), please **complete section H** only.
- ❑ If you have graduated from a teacher certification program and are not currently teaching, but are looking for a teaching position, please **complete section H** only.
- ❑ If you have graduated from a teacher certification program and are currently teaching, please **complete sections H and I** only.
- ❑ If you have graduated from a teacher certification program and are not currently teaching and do not wish to teach, please **complete section J** only.
- ❑ If you did not finish the teacher certification program and do not intend to do so, please **complete section J** only.

Section H: *(questions for those who are currently teaching, are in a program and have student taught (interned), or are currently looking for a teaching position)*

1. Please describe your teaching position, or if not currently teaching, describe your student teaching position:

In what U.S. state are you teaching? _____

Type of position

Subject(s) taught: _____

❑ part-time ❑ full-time ❑ temporary (student teaching)

Type of school: *(check all that apply)*

❑ parochial
❑ public
❑ private
❑ middle/junior high school
❑ community college
❑ elementary/grammar school
❑ high school
❑ suburban
❑ rural
❑ urban

Type of curriculum: *(check all that apply)*

❑ general academic
❑ special education
❑ college preparatory
❑ gifted and talented
❑ vocational education

2. If you are currently employed as a teacher, what is your annual salary? .$_____

Your Experience as a Teacher

1. What are the most positive aspects of your teaching experience? Please rank the following aspects of teaching.
1 = most positive, 5 = least positive. *(Please rank only one aspect a "1", one aspect a "2", and so on up to "5.")*

____ Academic success with students
____ Imparting knowledge of your content area
____ Other *(please specify)* _____
____ Interaction with young people
____ Influencing the lives of some students

2. What are the most negative aspects of your teaching experience? Please rank the following aspects of teaching.
1 = most negative, 9 = least negative. *(Please rank only one aspect a "1", one aspect a "2", and so on up to "9.")*

____ Stress
____ Discipline problems
____ Lack of respect from students
____ Lack of access to latest techniques, research
____ Other *(please specify)* _____
____ Salary
____ Lack of respect from community
____ Lack of time to prepare for class
____ Lack of support materials/technology/resources

3. What presented the greatest problem for you as a first-year teacher, or if not currently teaching, as a student teacher?

_____

_____

_____

_____

_____

_____

4. What was your greatest success as a first-year teacher, or if not currently teaching, as a student teacher?

_____

_____

_____

_____

_____

_____

5. Do you belong to professional organizations related to teaching? (Y/N) _____
If "Yes," which ones?

_____

_____

_____

_____

_____

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Assessment of the Program

1. Please fill out the following table on your instruction and preparedness in each of several aspects of teaching. Place a check mark as to whether you received information about each aspect, and also place a check mark indicating the level to which you felt prepared for that aspect of teaching.

Aspect of Teaching	*During your teacher education program*		*While teaching in the schools*			
	Received no information about	Received information about	Did not feel adequately prepared in	Felt adequately prepared in	Felt completely prepared in	Not relevant
knowledge of content						
content area methods						
psychological development						
learning styles/modalities						
learning disabilities						
handicapped students						
students with at-risk behaviors						
social and/or health problems of students						
resource utilization						
administrative tasks: • referrals • attendance • weekly reports						
other duties: • coaching • sponsoring						
evaluation tasks: • record keeping • assessment alternatives						
classroom management						
motivating students						
self-preservation						
building relationships with parents, students, administrators						

2. Please list 3 strengths of your teaching certification program: _____

3. Please list 3 weaknesses of your teaching certification program: _____

4. Please list 3 specific changes that you would make to the program: _____

5. What advice would you give to individuals looking to change careers into teaching in order to help them find the appropriate teaching preparation program for their needs? _____

If you have graduated from a teacher certification program and are currently teaching, please continue on to Section I, otherwise you are finished with this survey. Thank you very much for your participation!

Section I: *(questions for those who are currently teaching)*

1. Do you feel that you have adequate resources and support in order to do your job? (Y/N) _____
   If "No," in what areas do you need more resources and/or support? _____

2. How would you describe your adjustment to teaching? *(please circle the most appropriate response)*

Getting used to:	Very Difficult	Difficult	Moderate	Easy	Very Easy
Having control over curriculum	1	2	3	4	5
Not having an office/phone	1	2	3	4	5
Controlling a classroom	1	2	3	4	5
The demanding work load	1	2	3	4	5
Scheduling your time	1	2	3	4	5
Planning lessons	1	2	3	4	5
Developing teaching peer relationships	1	2	3	4	5
Isolation	1	2	3	4	5
Student nonacademic problems	1	2	3	4	5
Assessing student achievement	1	2	3	4	5

3. Describe your relationships with students, other faculty members, and the administration: (please circle the most appropriate response)

	Very Negative	Somewhat Distant	Cordial	Good	Very Positive
Students					
Overall	1	2	3	4	5
In class	1	2	3	4	5
Outside class	1	2	3	4	5
In clubs/after school	1	2	3	4	5
Teaching peers					
Overall	1	2	3	4	5
In the department	1	2	3	4	5
In other departments	1	2	3	4	5
At other schools	1	2	3	4	5
Administration					
Overall	1	2	3	4	5
Department chair	1	2	3	4	5
Principal/main office	1	2	3	4	5
Area supervisory board	1	2	3	4	5
Community					
Overall	1	2	3	4	5
Parents	1	2	3	4	5
PTA leaders	1	2	3	4	5
Business leaders	1	2	3	4	5

Relationship Between Former Work and Teaching

1. Do you now maintain a colleagial relationship with the co-workers at your former job? (Y/N) _____

2. Do you involve your students or teaching colleagues with the colleagues at your former job? *(For example, through visits, materials exchange, borrowing of equipment, etc.)* (Y/N) _____
   If "Yes," please describe your activities: _____

3. Do you bring a particular knowledge of technological applications in your field to your teaching profession? (Y/N) _____
   If "Yes," please describe: _____

You are finished with this survey. Thank you very much for your participation!

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Section J: *(questions for those who were in a teacher certification program but who are not currently working as a teacher nor looking for a job as a teacher)*

Your Decision not to Teach

1. Please tell us why you are not going into the teaching profession: *(check as many as apply)*
   - ❑ Wanted to pursue another career
   - ❑ Went on to further graduate or professional training
   - ❑ Could not afford to live on teacher's salary
   - ❑ Could not find a teaching position that pleased me
   - ❑ Other *(please specify)* _____
   - ❑ Did not enjoy teaching during student teaching/internship
   - ❑ Chose to stay home and care for family
   - ❑ Could not find a teaching position
   - ❑ Chose to retire

2. Would you consider entering the teaching profession later in life? (Y/N) _____
   If "yes," under what conditions? _____
   _____
   _____

3. If you are currently employed, what is your position? _____

4. Do you feel that what you learned about teaching and education in your teacher certification program was worth the time and money spent in the program? (Y/N) _____
   Please describe why or why not: _____
   _____
   _____

Assessment of the Program

1. Please list 3 strengths of your teaching certification program: _____
   _____
   _____

2. Please list 3 weaknesses of your teaching certification program: _____
   _____
   _____

3. Please list 3 specific changes that you would make to the program: _____
   _____
   _____

4. What advice would you give to individuals looking to change careers into teaching in order to help them find the appropriate teaching preparation program for their needs? _____
   _____
   _____
   _____

You Are Finished With This Survey.
Thank you very much for your participation!

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Appendix B

CLASSIFICATION OF ALTERNATIVE ROUTES

NCEI, for the sake of consistency in reporting and analyzing what is going on in the field of alternative teacher certification, has developed the following classification system for categorizing the "alternative routes" to the approved college teacher education program route for certifying teachers submitted by the states.

CLASS A is the category reserved for those programs that meet the following criteria:

- The program has been designed for the explicit purpose of attracting talented individuals who already have at least a bachelor's degree in a field other than education into elementary and secondary school teaching.
- The program is not restricted to shortages, secondary grade levels or subject areas.
- The alternative teacher certification programs in these states involve teaching with a trained mentor, and formal instruction that deals with the theory and practice of teaching during the school year--and sometimes in the summer before and/or after.

CLASS B: Teacher certification routes that have been designed specifically to bring talented individuals who already have at least a bachelor's degree into teaching. These programs involve specially designed mentoring and formal instruction. However, these states either restrict the program to shortages and/or secondary grade levels and/or subject areas.

CLASS C: These routes entail review of academic and professional background, transcript analysis. They involve specially (individually) designed inservice and course-taking necessary to reach competencies required for certification, if applicable. *The state and/or local school district have major responsibility for program design.*

CLASS D: These routes entail review of academic and professional background, transcript analysis. They involve specially (individually) designed inservice and course-taking necessary to reach competencies required for certification, if applicable. *An institution of higher education has major responsibility for program design.*

CLASS E: These post-baccalaureate programs are based at an institution of higher education.

CLASS F: These programs are basically emergency routes. The prospective teacher is issued some type of emergency certificate or waiver which allows the individual to teach, usually without any on-site support or supervision, while taking the traditional teacher education courses requisite for full certification.

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CLASS G: Programs in this class are for persons who have very few requirements left to fulfill before becoming certified through the traditional approved college teacher education program route, e. g., persons certified in one state moving to another; persons certified in one endorsement area seeking to become certified in another.

CLASS H: This class includes those routes that enable a person who has some "special" qualifications, such as a well-known author or Nobel prize winner, to teach certain subjects.

CLASS I: These states reported in 1991 that they were not implementing alternatives to the approved college teacher education program route for licensing teachers.

Reference List

American Association of Colleges for Teacher Education. 1989. *Rate III Teaching Teachers: Facts and Figures*. Washington, DC.

American Association of Colleges for Teacher Education. 1993. *Alternate Paths to Teaching: A Directory of Postbaccalaureate Programs*. Washington, DC.

Association of Teacher Educators. 1989. *Alternatives, Yes. Lower Standards, No!* Reston: Virginia.

Baird, Adrian. 1991. *Alternative Teacher Certification Programs.* Washington, DC: U.S. Department of Education.

Baird, Adrian. 1992. *Alternative Teacher Certification Programs.* Washington, DC: U.S. Department of Education.

Barnes, Susan, James Salmon, and William Wale. 1989. "Alternative Teacher Certification in Texas." Paper presented at the Annual Meeting of the American Educational Research Association.

Clifford, Geraldine J. and James W. Guthrie. 1988. *Ed School: a Brief for Professional Education.* Chicago, IL: University of Chicago Press.

Darling-Hammond, Linda, Lisa Hudson, and Sheila Nataraj Kirby. 1989. *Redesigning Teacher Education: Opening the Door for New Recruits to Science and Mathematics Teaching.* Santa Monica, CA: The Rand Corporation.

Dessel, Norm and George Mehaffy. 1989. "Navy Fast Track Program." Paper presented at the Annual Meeting of the Association of Teacher Educators.

Education Commission of the States. 1990. *Alternative Routes for Teacher Certification.* Denver, CO.

Feistritzer, C. Emily and David T. Chester. 1992. *Alternative Teacher Certification: A State-by-State Analysis, 1992-93.* Washington, DC: National Center for Education Information.

Feistritzer, C. Emily and David T. Chester. 1993. *Alternative Teacher Certification: A State-by-State Analysis, 1993-94.* Washington, DC: National Center for Education Information.

Freidus, Helen and Maris Krasnow. 1991. "Second Career Teachers: Themes and Variations." Paper presented at the Annual Meeting of the American Educational Research Association.

BEST COPY AVAILABLE

Hassard, Jack. "Alternative Certification of Secondary Foreign Language, Mathematics and Science Teachers." Unpublished report, ED317493.

Madfes, Tania J. 1989. "Second Career Teachers--Second Challenges: Meeting the Needs of the Older Teacher Education Student," paper presented at the Annual Meeting of the California Educational Research Association.

Madfes, Tania J. 1991. "The Chevron ENCORE Midcareer Program and the Mid-Life Career Change to Teaching Science and Mathematics Study," paper presented at the Annual Meeting of the American Educational Research Association.

Merseth, Katherine. 1986. "Rear Admirals and Biochemists: Why Do They Want to Teach High School?" Unpublished report, ED271307.

National Center for Education Statistics. 1985. *The Condition of Education.* Washington, DC: U.S. Department of Education.

National Education Association. 1990. *Ensuring High Standards in Nontraditional Routes to Licensure.* Washington, DC.

Ravitch, Diane. 1985. *The Schools We Deserve.* BasicBooks, A Division of Harper Collins Publishers.

Wise, Arthur E. and Linda Darling-Hammond. 1991. "Alternative Certification Is an Oxymoron." In *Education Week* (September 4).